Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone, Sound Waves
PUBLISHED WEEKLY BY TELEPHONY PUBLISHING CORP.
608 S. Dearborn St., CHICAGO

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Entered as second-class matter September 4, 1908, at the postoffice at Chicago, Ill., under act of March 3, 1879.

Volume 92
Number 24

CHICAGO, SATURDAY, JUNE 11, 1927

Subscription — 10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

OPERATING MANAGEMENT THE TEST OF TELEPHONE FINANCING

A leading business journal predicts that Congress will resume the pursuit of its mania for investigating big business next fall, and adds, "trouble is brewing for public utilities." This warning is based on the theory that because so many mergers have taken place among public service companies, Congress will probe into their financial pyramids for the purpose of ascertaining if they help or hurt public interest.

There have been many consolidations in the telephone field, but it is fair to assert that telephone mergers are not the principal target of official investigators *right now*. Compared to the gigantic mergers in the electrical power industry, the various telephone consolidations that have been made are minor transactions.

What the political guardians of "the people's interests" are after are the huge combinations of capital that are working on the so-called "super-power" projects. Their complex holding companies got some unfavorable publicity in Washington last year, and they are due to get more in the near future.

* * * *

At the same time, if the result of Congressional investigations is a demand for more strict supervision of the financial factor known as "a holding company," that has developed during the consolidation era, the telephone industry will also come in for a share of the scrutiny.

The state commissions feel that they ought to have more control of holding companies and be able to regulate these concerns that handle the finances of the operating companies giving service.

The commissions regulate the operating companies but have no adequate jurisdiction over the holding companies, especially if they are incorporated in another state, as is usually the case. Delaware is the state having the highest birth rate for holding companies.

* * * *

Naturally, perhaps, the commissions that can regulate the service companies feel that they should also control their financial boss which is selling their stocks and bonds in the state, and it is extremely likely that something will be accomplished along that line at no distant date.

Those interested in the destinies of utility properties should keep these developments in mind, and plan accordingly.

* * * *

The real test of all the buying, grouping and financing of Independent telephone properties that is now going on has not yet come.

It will come when bankers and other non-telephone men controlling telephone companies obligated for high fixed charges through the lavish issue of securities against them, find that, sound as the telephone business is, it will not continuously produce net income applicable to the payment of these fixed charges without constant, experienced and competent *telephone* management.

Telephone men, familiar with some of the deals that have been made and some of the financing that has been done believe that nothing less than super-management will serve in some cases.

* * * *

When the smoke of buying and financing has blown away and the financing profits have been taken, and the bonds and preferred stocks are in the hands of a public expecting its interest and dividends regularly, then the routine day-by-day task of *operating* the property will be the all-important thing. Then, and not until then, will the real test come.

Estimates of prospective earnings will not pay interest and dividends. Estimates of expenses must finally give way to actuality of real expense. Expenses and taxes must be paid; the property must be rehabilitated and repaired at times, whether or not there is allowance or reserve for depreciation for that purpose.

Income must be produced in *money* for all these purposes. Optimism and estimates must give way to facts.

* * * *

Only the telephone man who has, through years of experience, faced and met the many day-by-day questions and problems in the actual operation of a telephone business can appreciate the heart-breaking struggle of trying to operate profitably an over-capitalized company.

The real test will be the test of *management*. Experience will prove that in these new companies, as well as in the old

established companies continuing in present hands, the most valuable asset to the business will be experience in and knowledge of the telephone business.

In other words, "the telephone business for telephone men."

* * * *

Public service companies are often in a quandary what to do about taking advertising space when the local newspaper issues a special edition. This is done usually to celebrate an event like the 50th anniversary of the town or the birthday of the newspaper, and means the publication of a large edition in which all the industries of the community are given extensive write-ups.

Naturally, the local utilities desire to be represented in the advertising section as they wish to be identified with such community affairs in order to maintain their public relations, and also to share in the general publicity, but frequently they are in doubt how to utilize the opportunity.

What to put in the space is the question. It is futile to fill it with stereotyped matter, but a little careful study will show ways of using it that will build good will and result in worth while advertising that will do the company real good.

If the birthday of the newspaper is being commemorated, a good way to use its space is for the company to congratulate the newspaper staff on the occasion, tell what a live up-to-date journal means to a town, and, incidentally, what the same sort of a telephone company is trying to do in the same direction.

If the event is historical of the city, a good plan is to note the growth of the community through the years and relate how telephone service has contributed to its progress and how it has kept pace with its advancement. It is a fruitful subject and gives the telephone company an excellent opportunity to boost home affairs.

When handled right, special editions are not the nuisances some telephone men may be tempted to think, as they really offer a fine chance for effective publicity.

COMING CONVENTIONS.

Vermont, Burlington, Van Ness House, June 14 and 15.

Washington, Edmonds, June 17 and 18.

Directors of U. S. Association Meet

National Convention to Be Held in Chicago Probably October 18-23—Hotel to Be Selected Later—Unsound Financing Said to Be Subsiding—Two Directors Elected to Fill Vacancies on Board—Discussion of Depreciation

At a meeting held June 3, the board of directors of the United States Independent Telephone Association instructed the officers—President MacKinnon and Secretary Deering—to arrange to hold the annual convention in Chicago as near the date October 17 as possible. This means that, if hotel schedules permit, the convention will be held October 18 to 21. Either the Hotel Sherman or Hotel Stevens will be selected for the meeting place.

There was a good attendance when President MacKinnon called the directors to assemble at the Edgewater Beach Hotel at 10 o'clock Friday morning, June 3. Those present were:

J. H. Agee, Lincoln, Neb.; E. C. Blomeyer, Kansas City, Mo.; W. G. Brorein, Tampa, Fla.; W. H. Bryant, Mobile, Ala.; Chas. C. Deering, Des Moines, Iowa; H. F. Farwell, Terre Haute, Ind.; E. D. Glandon, Pittsfield, Ill.; H. L. Harris, Chicago; C. L. Jones, Athens, Ohio; Frank A. Knapp, Bellevue, Ohio; W. J. Lescure, Harrisburg, Pa.; W. Roy McCanne, Rochester, N. Y.; Houck McHenry, Jefferson City, Mo.; W. J. Melchers, Owosso, Mich.; G. W. Robinson, St. Paul, Minn.; E. D. Schade, Johnstown, Pa.; C. A. Shock, Sherman, Tex.; L. Q. Trumbull, Chicago; Ben Woodbury, Chicago.

The executives of operating companies attending the conferences of Class A members of the association were invited to attend the directors' meeting, and a number accepted, including Frank E. Bohn, of Fort Wayne, Ind.; W. G. Bickelhaupt, president of the Dakota Central Telephone Co., Aberdeen, S. D.; John Z. Miller, Erie, Pa., and A. J. Curren, Elyria, Ohio.

After Secretary Deering had read the minutes of the previous meeting, and they were approved, he presented a list of companies which had filed applications for membership in the association. The following companies were elected members and placed on the roll of the association:

W. L. Jacoby, Who Succeeded J. B. Edwards as President of the Kellogg Switchboard & Supply Co., Has Been Elected to Succeed Him as Director and Also as Member of the Executive Committee of the United States Independent Telephone Association.

Oregon Telephone Co., Marshfield, Ore.; Monroe Telephone Co., Monroe, N. C.; Randolph Telephone Co., Ashboro, N. C.; State Telephone Co. of Wisconsin, Madison, Wis.; Rural Telephone Co., Osceola, Minn.; Local Telephone Co., Clifton, Ill.; Nevada, California & Oregon Telephone Co., Susanville, Cal.; Quick Directory Co., of Indianapolis, Ind.; Cambridge Telephone Co., Cambridge, Ohio; St. Mary's Telephone Co., St. Mary's, Ohio; Blue Earth County Telephone Co., Lake Crystal, Minn.; Ida Telephone Co., Ida, Mich.

The question of fixing the dates for the annual convention was then brought up by President MacKinnon. After a general discussion, on motion of Mr. Bryant, seconded by Mr. Farwell, the board instructed the officers of the association to make arrangements to hold the convention in Chicago during the week as near October 17 as practicable. As usual, the convention probably will extend over four days, beginning Tuesday morning and ending Friday afternoon.

President MacKinnon informed the meeting that he had received the resignation of J. B. Edwards as a member of the board of directors, Mr. Edwards retiring shortly after resigning as president of the Kellogg Switchboard & Supply Co. Mr. Woodbury, saying that W. L. Jacoby had succeeded Mr. Edwards as president of the Kellogg company, moved that Mr. Jacoby be selected as an association director.

This motion was seconded by H. L. Harris. Mr. Knapp moved that the nominations be closed, and, on a second by Mr. McCanne, the motion was carried.

Mr. Jacoby was then elected by acclamation as director, President MacKinnon stating that the board would notify Mr. Edwards that his resignation was accepted with sincere regret, in view of his long and valuable services in the Independent telephone field. Later in the session Mr. Jacoby was placed on the executive committee to fill the vacancy created by Mr. Edward's resignation.

President MacKinnon announced the vacancy on the board caused by the death of George R. Fuller, of Rochester, N. Y., and expressed the sincere sorrow felt by all because of the passing of "the grand old man," as Mr. Fuller was affectionately known by all Independent telephone men.

The president referred to the occasion at the 1926 annual convention, when Mr. Fuller bade good-bye to his many friends just before he left for Rochester, and feelingly related the expressions of regret made at that time by those who were present. "We did not realize it at the time," said President MacKinnon, "but it was indeed good-bye."

Mr. McCanne was recognized and placed in nomination John P. Boylan, who is the new president of the Rochester Telephone Corp., and urged his selection. Mr. McHenry moved that the nominations be closed, and H. L. Harris seconded the motion. Mr. Boylan was unanimously elected director.

On motion of Mr. Brorein, seconded by Mr. Farwell, the secretary was directed to send the family of Mr. Fuller a suitable resolution setting forth the esteem in which he was held by all members of the United States Independent Telephone Association.

In considerable detail, President MacKinnon then reported to the directors the result of the conferences held by the executive committee with the Bell officials regarding transfers of Independent properties. He cited the original agreement between the two groups, and the proposition of the committee that there should be no more Bell purchases unless there were corresponding relinquishments on the part of the Bell organization.

Conferences with the Bell representatives brought out the fact that they desired to withdraw the stipulation that 30

John P. Boylan, President of the Rochester Telephone Corp., Rochester, N. Y., Is a Newly-elected Director of the United States Independent Telephone Association, Succeeding the Late George R. Fuller.

days' notice be given before negotiations for purchase, inasmuch as the Bell subsidiary companies found it defeated their purposes.

Meantime, President MacKinnon pointed out, outside buying of telephone plants began, and both groups had a common interest in preventing the buying of properties by speculators who planned to exploit the telephone field.

According to the present agreement, the Bell is to give the Independent association 30 days' notice before signing a contract to buy, and also to give notice of options.

If the Independent group has a buyer for the property involved, the matter will be considered in conference by the two groups, the purpose being to see that when ever possible, the Independents are to retain the property offered, "for the best interest of all concerned."

President MacKinnon said that he believed the wave of telephone buying is subsiding in the Middle States, where it raged so furiously during the last year, as investment bankers are waking up to the danger of unsound financing. He said that the speculators are now realizing that they cannot sell over-valued properties to the Bell organization, and this has a tendency to slow down indiscriminate buying for high prices.

"The articles in TELEPHONY and the association circulars have had much to do with bringing the telephone financial situation down to a safer basis," said President MacKinnon. "I was told the other day that we were wrong in assuming that this indiscriminate buying was for the purpose of issuing inflated securities. The real purpose was to turn the properties over to some one else—presumably the Bell.

"The A. T. & T. Co., however, is just as anxious to stop this high financing as we are, and is not going to encourage speculative buying by taking over everything that is offered. I believe the situation is much improved."

Several cases are awaiting action by another group conference which will be held in July. Among them are a number of transactions affecting properties in Pennsylvania.

The directors held a meeting Friday afternoon at which depreciation was generally discussed. The telephone fraternity feel that great vigilance is needed to assure that its rights are protected before the Interstate Commerce Commission, which is to have charge of depreciation accounting regulations.

Conference of Class A Independents

Executives, Accountants and Engineers of Member Companies of United States Independent Telephone Association at Third Annual Conference in Chicago Have Talks on Operating Results, Depreciation and Other Matters

The third annual conference of Class A member companies of the United States Independent Telephone Association was held at the Edgewater Beach Hotel, Chicago, last week Thursday, Friday and Saturday, June 2, 3, and 4.

A greater number of the companies was represented at this year's meeting than at any previous conference, 33 companies having representatives in attendance. There were a total of 80 present. The representatives came from Washington, California in the West, Minnesota and South Dakota in the North, Texas, Florida, South Carolina in the South, and New York and Pennsylvania in the East, with many states in between represented.

President F. B. MacKinnon of the United States Independent Telephone Association presided at the general sessions, which were held Thursday and Saturday morning.

In many ways, the conference was most valuable and enabled the companies to reach agreement on many of the points involved in the depreciation order of the Interstate Commerce Commission.

At the general session on Thursday morning, Chairman MacKinnon presented a general statement of the program for the conference, stating that special consideration would be given the order on depreciation of the Interstate Commerce Commission. He discussed generally the charts of statistics of operations of the 52 class A member companies, which the association has compiled. One of these charts is reproduced on the following page.

A. L. Staderman, chief engineer, Citizens' Independent Telephone Co., Terre Haute, Ind., presented an outline for the consideration of depreciation given from

the telephone engineer's point of view.

Roy F. Wilder, general commercial manager of the Tri-State Telephone & Telegraph Co. of St. Paul, Minn., was introduced by Mr. MacKinnon as the chairman of the newly-created commercial division of the association. The plant, accounting, and traffic divisions having been well established, the association is now paying attention to the commercial branch of its member companies. Mr. Wilder gave a brief outline of the purposes of the commercial division and what it will attempt to accomplish.

At the Thursday afternoon general session, Chairman MacKinnon outlined some of the depreciation order points in the Interstate Commerce Commission, to which objection has been made by the national association, and gave the present status of the order.

C. B. Randall, vice-president of the Tri-State Telephone & Telegraph Co., and special counsel of the association on the depreciation order, explained the legal points in the order, after which H. F. Wheeler, chief engineer of the Lincoln Telephone & Telegraph Co., Lincoln, Neb., presented an illustration of a method to be employed by the class C companies in spreading their plant accounts on their books in the 26 classes prescribed by the Interstate Commerce Commission and for arriving at the rate of depreciation to be set up for each such classes of property.

Friday was given over to separate sessions of the accountants and engineers and the executives. W. L. Lemon, auditor of Lincoln Telephone & Telegraph Co., Lincoln, Neb., and chairman of the association's accounting division, presided over the joint conferences of the accountants and engineers and President MacKinnon over the executives' conference.

At the joint conference of the accountants and engineers, points in the order on depreciation of the Interstate Commerce Commission were taken up. Presentation and discussion of the following subjects were made:

"Service Life Pricing on Re-usable Material," by A. C. Cragg, St. Paul, Minn.

"Extraordinary Repairs," by Frank J. Brookman, Rochester, N. Y.

"Classes of Depreciable Property," by C. E. Archer, Tampa, Fla.

"Operating Expense Adjustments," by F. J. Tellman, Ft. Wayne, Ind.

"Separation of Depreciation Reserve," V. E. Chaney, Kansas City, Mo.

"Illustration of Telephone Companies' Application of the Interstate Commerce Commission's Order to Accounting Practice of Class C Companies," by H. F. Wheeler, Lincoln, Neb.

The executives' session on Friday afternoon considered the procedure to be adopted in complying with the Interstate Commerce Commission's order on depreciation from the management viewpoint. At this session there was also further discussion of the operating data submitted at the Thursday morning session, and the differences in accounting practices disclosed by the data.

At the closing general session on Saturday morning, President MacKinnon summed up the special points upon which questions were asked.

Recent Statistics of Lincoln (Neb.) Telephone & Telegraph Co.

Statistics just released by the Lincoln Telephone & Telegraph Co., of Lincoln, Neb., show a steady growth in the 22 counties in southern and southeastern Nebraska comprising its territory, in the greater use of its facilities, the increase in number of stations and the wider distribution of its securities.

For the first three months of the year the company gained 1,065 stations in the entire territory, making a total of approximately 76,000 in use. The telephone wire mileage of the company increased during the same period 506 miles. The completed conversations daily number more than 517,270, a gain of more thane 8,000 daily over the same period last year.

The number of holders of preferred stock is now more than 3,500, or nearly double what it was five years ago; 40 per cent of the number are women. Employes of the company now number 1,212, a gain of 38 for the four months of the year, and of this number 60 per cent are paying for stock under the employe's stock purchase plan.

	1917.	1924.	1925.	1926.	1917–1926. Increase.	1925–1926. Increase.
Number of central offices	807	879	895	972	165	77
Number of telephones	525,496	805,654	865,001	985,603	460,107	120,602
Toll wire mileage	.....	158,496	169,158	164,547	.....	†4,611
Fixed capital	$ 72,645,514	$106,865,342	$133,186,294	$153,941,283	$ 81,295,769	$ 20,754,989
Total assets	83,550,245	134,227,519	153,296,204	176,381,701	92,831,456	23,085,497
Capital stock	38,088,033	59,007,220	63,860,085	76,114,600	38,026,567	12,254,515
Funded debt	25,423,621	33,856,439	44,687,523	51,397,375	25,973,754	6,709,852
Operating revenue	$ 14,255,673	$ 31,404,231	$ 34,084,969	$ 38,871,042	$ 24,615,369	$ 4,786,073
Depreciation	$ 2,149,946	$ 5,293,983	$ 5,747,193	$ 6,678,443	$ 4,528,497	$ 931,250
Current maintenance	2,409,882	5,115,075	5,735,900	6,339,301	3,929,419	603,401
Traffic	2,420,813	6,138,804	6,334,322	6,837,128	4,416,315	502,806
Commercial	1,227,225	2,332,905	2,544,853	2,943,963	1,716,738	399,110
General and miscellaneous	1,160,566	2,054,253	2,146,729	2,523,055	1,362,489	376,326
Total operating expenses	$ 9,368,432	$ 20,935,020	$ 22,508,997	$ 25,321,890	$ 15,953,458	$ 2,812,893
Net operating revenue	4,887,241	10,469,211	11,575,972	13,549,152	8,661,911	1,973,180
All other revenue	1,255	388,902	536,947	546,026	544,771	9,079
Taxes	$ 716,664	$ 2,300,273	$ 2,537,623	$ 2,880,933	$ 2,164,269	$ 343,310
Other deductions	397,759	979,517	952,250	1,313,363	915,604	361,113
Total deductions	$ 1,114,423	$ 3,279,790	$ 3,489,873	$ 4,194,296	$ 3,079,873	0 704,423
Income available for interest and dividends	$ 3,774,073	$ 7,578,323	$ 8,623,046	$ 9,900,707	$ 6,126,634	$ 1,227,661
Interest	1,536,210	2,359,661	2,552,580	2,684,602	1,148,392	132,022
Available for dividends	$ 2,237,863	$ 5,218,662	$ 6,070,466	$ 7,216,105	$ 4,978,242	$ 1,145,639
Percentages:						
Operating revenue to fixed capital	19.6	29.4	27.0	25.2		
Income available for interest and dividends to fixed capital	5.2	7.1	6.5	6.4	Gain in Telephones: Percentage:	
Net income to capital stock	5.9	8.8	9.5	9.4		
Interest to funded debt	6.0	6.3	5.7	5.2	1917–26 .....43.6	
Depreciation rate	2.5 to 2.9	4.9	3.8 to 4.3	3.8 to 4.3	1924–25 ..... 7.4	
Operating ratio—operating expenses to operating revenue	65.7	66.6	66.4	65.1	1925–26 .....13.9	
*Operating ratio—all expenses to operating revenue	73.5	77.1	78.0	76.0		

*This ratio includes taxes, rents and other deductions as operating expense.
†Decrease.

General Comparative Summary for 1917–1926 Inclusive, of Operating Results of Class A Member Companies of the United States Independent Telephone Association.

Nation's Capital Has 127 Per Cent Gain in Telephones.

Washington, the nation's capital, has had an increase of 127 per cent in the number of telephones in the last ten years.

The city is now served by ten central offices and 138,000 telephones. Last year about 9,300 telephones were added to the system.

Traffic Thoughts from Ohio Meeting

Many Questions Discussed During Traffic Conference at Recent Convention of Ohio Independent Association—Points for Chief Operators to Consider—Toll Operating Has Interesting Features—Problems of Traveling Chief Operator

Subjects for Traffic Conference Discussions.

By R. F. PAGELS,

Traffic Superintendent, Warren & Niles Telephone Co., Warren, Ohio.

Sometimes, I believe, employes forget that a meal ticket is supplied by those who buy our service. When we are selling a high-class article, we still have one apology to offer; we are sorry because it is not better. In other words, our job of better service is only started. When we eventually terminate our efforts, some good and faithful servant will take them upon herself, or himself, to carry on and again making possible a better and larger standard of service which we possibly failed to reach.

Next let us take up the thought back of these meetings, which are so kindly sponsored by the officials of the many state organizations. I am happy to think of the great change which has been brought about during the past ten years, and in many states it has been much less.

Telephone association meetings have been going on for more than 25 years, but who ever heard of a traffic conference until comparatively recent years? I am wondering if operators were needed in the early days. Sometimes I feel much was lost by company officials when they used the convention dates as an alibi to get away for a good time, rather than to give some consideration to other departments of their organization, which were and still are just as important to the business which they had so near to their hearts.

Evolution has done much, and is continually busy in our daily business. Without a doubt many interested employes would be here today if they were given leave from their duties at the home station. I would feel badly if they were deprived of attending a conference of this kind, for the reason that the manager could not justify the expenses.

To the manager I will say this: Regardless of where your business is, in this or any other state, you all expect a lot from your operating department. The operators are your sales ladies. What are you giving in return?

The chief operator is the target when irregularities are called to your attention. Cut-offs are always pushed over to the chief operator, regardless of the fact that, perhaps, the cable department or plant department is doing the damage by careless work.

I know many managers are of the opinion that the chief operator is not progressive, but is it always her fault? Is it not a fact that her daily routine is keeping her time occupied? Has she any way of accumulating additional knowledge through her daily associates? Is there any reason why she would not get into a rut?

Chief operators are not the only individuals who get on a narrow path. I know managers who have been there for years—and they are hopeless. In each case the service to the public is just as antiquated. Why not get into the business and join the good fellowship from which we can and will profit? Why be like the Scotchman who was lost during the three convention days? When finally found, he was sitting in a pay-as-you-leave street car.

R. F. Pagels of Warren, Ohio, Conducted a Most Successful Traffic Conference During the Recent Ohio Convention at Columbus.

I feel for the office and organization which is so complete in every way that they do not need a neighbor who has another thought.

In checking over the attendance of this kind, we find a very large percentage that is responsible in a supervisory capacity. This being the case, there has always been a question in my mind as to what subject would be most valuable to cover.

To me it would be more interesting if a subject of an advanced character were debated, as the student studies have long been passed. We are now confronted by problems which are more important, and textbooks have not been written that relate the experience of the past.

First, we must realize our position in order that we may set the proper example for the other employes. All eyes and ears are trained upon us. It is not what we say or do but how. This is not a new remark, but I am wondering how often we take inventory of ourselves?

To me, an operating room is not a kindergarten department; neither should it be necessary to tell bedtime stories. As a rule the people who are employed in any traffic department are of an age which leads us to believe that they know right from wrong, and can understand the rules when properly instructed. However, we also know that many insist on taking advantage of supervisors and chief operators. One may say: Employ folks who are loyal. Fine! How are we to judge the loyal young woman in any other way than by the test of a period of service?

How are new people employed? Does the manager do it or the chief operator? Are we getting the girl who will work with us, or are we compelled to worry with some one who has a pull with an official of the company?

To me this is an important factor. Some folks have, to my knowledge, been given the advantage over others. What will an act of this kind do to our organization? Can we select our chief operators or supervisors on the basis of period of service only?

While it is true, when selecting either, that we cannot overlook the necessity of knowledge of the business, likewise a reasonable period of service, to me the personality and ability to command respect is a more important factor.

How are we asking the attention of an operator, who has been associated with a wrong or irregular happening? Are we carelessly doing this in the presence of all others on duty, and bringing about the possibility of disgrace and producing ill feeling, also building a basis for the individual to want to get even? Or are we taking the individual, who is only human as we are supposed to be, into our confidence and pointing out the wrong, and then with kind words setting them right? Which is the better plan?

My answer is: When kindness fails, plan on making a change. When we are right and kindness has been overruled, nothing good is left to accomplish.

During the past three months I have found a number of cases where the maintenance department had little or no confidence in trouble reported by the traffic department. A condition of this kind is

serious. I also found the traffic department had been careless, and this can happen in any size office. Can anyone imagine trouble being reported, when three hours previous to the report the repairs had been completed?

These cases are numerous and should be avoided. How smoothly the work is carried, when each department has confidence in the others!

Another irregularity which stands out in my mind, and in many cases causes the commercial department many unpleasant moments, is due to the traffic department being the careless offender. Are we in every case at fault when tickets, originating at tributary points, are over-timed by the toll center? I know of offices other than Independent that are over-checking actual conversation periods as much as eight minutes, and I am very conservative. If conditions of this kind exist—and they do in many places—and continue until the toll-using public discover it, what is going to be the result?

Personally I am in favor of getting every moment of toll line service to which we are entitled, but I do not believe that we should treat the honest user unjustly. I am anxious to receive an explanation of how this condition is to be overcome. Is it reasonable to ask the toll operator at the toll center to monitor each conversation, or should the tributary office do it?

I have checked both classes of service. First, a call originating at the magneto exchange and timed at the toll center without proper supervision; and likewise the tributary that has common battery equipment. In this case, the tributary office will signal the toll center for disconnect, providing the toll center answers the supervisory signal.

This could be accomplished in the same way from the magneto exchange, providing, as the following takes place. The subscriber rings off or tells the tributary operator he has completed his conversation, and she in turn causes an alarm at the toll center. After the elapsed time the toll center stamps the ticket and again tells the tributary the total number of minutes and also the padded charge. When the subscriber gets his charges, he has a right to ask questions.

To me this analysis is as simple as the bet made between two of a certain nationality. Each bet the other that he could stay under water the longer period of time. Hence they both drowned.

Protect your neighbor, respect them, and you will receive the same in return.

ASSETS OF CHARACTER.

Every boy and every girl must have certain assets to achieve success. Not material assets alone, but assets of character. Among the most important of these are ambition, industry, personality and thrift.

Ambition is the will to attain something. The desired object may be knowledge, or honor, or power; but whatever it is, the ambition to reach it must be backed up by the willingness to work for it. Mere wishes accomplish little without the aid of earnest application and industry.

The asset of personality is more elusive, and seems to be born in some people without any effort on their part. But on the other hand, it may be acquired by every one who will concentrate on his career and not let it be marred by carelessness and indifference.

To save a part of what one earns is another vital element in a successful life. Savings are not only insurance against the turns of fortune, but also a means of seizing golden opportunities.
—Secretary Andrew W. Mellon.

Many Interesting Features of Toll Operating.

Miss Nell Murray,
Toll Chief Operator, Lima Telephone & Telegraph Co., Lima, Ohio.

It is the business of the telephone company to give service that is satisfactory to the public. Such service involves speed, accuracy, courtesy and the final completion of calls.

Toll operating is one of the most interesting features of the telephone system. Unlike the local call, wherein one operator is responsible for completing the connection, a toll call requires the cooperation of a number of operators; from the recorder to the operator in the distant city, each is dependent on the other, if the call is to be a success.

The recording operator is the direct representative of her company in answering the demands of the public for toll service. If the subscriber meets with a wide-awake operator, one who is courteous and obliging, she impresses upon his mind that it is her desire to handle his call with the greatest efficiency and speed; and he feels sure that he is going to get the best of service.

The best way to record a call is to let the patron give it in his own way. When he has finished, if he has omitted some of the necessary details, the operator should request them in a courteous manner. If she is in doubt as to any of the details given, they should be verified with him.

We have our directory operators, whose duties may seem small, but are really most important. She furnishes telephone numbers on calls that require directory work, also routings and rates on all calls.

Numbers looked up by the directory operator are encircled. Those furnished by subscribers are not. Errors may be checked in this way, as subscribers frequently furnish wrong numbers, which cause a delay in completing calls as well as annoyance to subscribers at the distant city, and our subscribers also. This applies also to wrong routings. We must use the proper routes assigned us, so as not to delay or impair the quality of our service.

When quoting rates, the operator should be careful that the subscriber understands the class of rate she is giving him. Different classes of calls take different rates effective at certain hours during the day and night.

It is important that these rates and hours be quoted accurately. When a patron asks for an evening rate, and then places a call for a particular person, it is plain that he does not understand the rules governing the evening and night rates, and the operator should explain them to him.

There is a correct explanation for every one of the many hundreds of questions asked by the subscriber, and a really efficient operator will take the trouble to explain and show him the reason for certain rules which the average patron does not understand. She should not just inform him that "it's rules," and let it go at that.

As the recording operator is the representative of the company to the public, the inward operator represents her station to other stations. It is a pleasure to deal with a station whose operators are courteous and obliging. If the inward operator rings the wrong number, it causes a delay in the completion of a call. Every wasted second is lost revenue for the company, and both inward and outward operators should guard against unnecessary delays in operating.

The duty of the outward operator is to complete calls. She should see that nothing is neglected whereby a call may be completed. In giving reports, the operator's question, "Will you talk with any one else?" often reminds the calling party that he can just as well talk to an alternate.

Reports of *NF* (no telephone) may cause many uncompleted calls, but there are steps which, if properly taken, will save the call. If the subscriber is unable to furnish another listing, the operator may suggest sending a messenger.

Even though it may be necessary to call several places to locate a party, and our efforts result in a cancelled call, the patron leaves the telephone feeling that he has been given good service, and the operator has the satisfaction of knowing that she has pleased the subscriber, which is one of the principal aims of the company.

Cancelled calls represent not only waste of circuit time and dissatisfied subscribers, but a low completed per cent for the day's business.

It is impossible to complete every call offered, but when the operator has reason to believe a call could be completed on the following day, it is her business to suggest this to the patron and, if it is satisfactory with him, to carry the call forward. Such calls are given the same attention as new calls filed, and every effort is made to com-

plete them, for this means a gain over the business of the previous day.

I think that there are very few if any operators who will accept a cancellation without making an effort to save the call, although I have been told of operators saying "Thank you" when a subscriber orders a call cancelled; then on the following day they wonder why our completed per cent is so low. They say, "Well, I've done all I could"—and they have done all they could to make it what it is. Ninety per cent completed for the day is considered good, but many offices do much better.

The telephone today offers a large field for the girl who is not afraid to work, and who enters upon her duties determined to make good. There is a universal interest in its wonderful development in less than half a century, with its hundreds of thousands of workers, whose public service is so important, and so appealing to the telephone subscriber everywhere.

Less than three months after the world was given the transatlantic telephone, we had television demonstrated. Not only was the speaker's voice heard plainly, but the speaker himself was seen clearly. So rapid has been the advance in electrical research work that we may truly wonder where it will end or what will be next.

Problems of a Traveling Chief Operator.

By GRACE M. PELTIER,
Traveling Chief Operator, Northern Ohio Telephone Co., Bellevue, Ohio.

Did you ever stop to think of the problems of a traveling chief operator? The managers and chief operators in every office have their own individual problems, and the traveling chief operator's problems are yours, plus those of the other offices in her territory.

How can we solve them, is the next question. In my work as a traveling chief operator, my problems with few exceptions have been easily solved; and the credit for this I give to the managers and chief operators for their splendid spirit of cooperation.

I will try to tell you briefly some of the duties of a traveling chief operator, and which are your problems as well as hers. One is force requirement. Do you study your traffic to see whether your operators schedule corresponds? Do you have too many operators at one time, not enough at another? Or do you have more than you really need?

We are in your office but a few hours at a time and are unable to get a fair picture of your traffic. This you can help us solve by observing the traffic and number of operators you need at certain hours during the day, or by taking peg counts which will enable us to make schedules to fit your traffic load. A peg count also gives you an idea of the amount of traffic really going through your office.

Today, in your office I spent several hours teaching your operators the standard methods of operating, so that their work would be made easier and the public benefited by better service.

Tomorrow, I am in another office 50 miles or more away, and I feel confident that your operators are putting into practice the different methods which were discussed in the class. Are they, or are they not? Who but the chief operators can help us solve this problem?

The distribution of your traffic is another of our greatest problems. Are you giving to another company revenue that should rightfully belong to your own? Why not check each day's business to show where you stand, either on the debit or the credit side? If your daily records show a loss, and it is caused by equipment trouble or by poor transmission, managers, there is your work. If it is due to negligence of operators, chief operators, there is your work.

In connection with the distribution of your traffic, the completion of toll calls is equally as important. Show your subscriber you are interested in completing his call, by keeping him posted as to what is being done on it.

If you are unable to complete a call on the day it is filed, suggest to your subscriber that you be allowed to work on it the following day. Calling subscribers and trying to revive calls that were cancelled the day previous, will give them the idea that you are particularly interested in retaining their patronage.

A cancelled call does not mean a satisfied customer; neither does it mean much revenue. Making special effort each day to complete your calls means not only a higher per cent of completion and more revenue for your company, but it means giving to the public the service for which they are paying.

We receive only a monthly report of your traffic, the number of calls offered and completed, and it is too late then to save calls, which with a little more effort might have been completed. Make the slogan for your office "Today, not tomorrow," and you can help us in solving another great problem.

The interest shown by chief operators and managers in the practices and ideas we try to put in effect tells us whether or not they will be carried out. The monthly record we receive from your office shows us where you stand, but we like to hear from you just what you are doing and whether our ideas are successful or not.

One manager whose office I visit put into effect the different methods that were suggested and then studied the traffic to show just what the result would be. At the end of one month he sent a report to us showing the percentage of calls completed by using the methods suggested.

In going into this office, I can be certain that I will receive the cooperation of the manager and chief operator, for he proved that they were interested when he made that study. Can not others fall in line and work with us the same as this manager?

London Paper Sees Struggle for World Telephone Control.

Possibility of a struggle between the United States and Great Britain for control of the world's telephone communication business was forecast May 26 in an article featured in the "London Daily Mail," which was read with much interest by Wall Street, according to an item in the New York Tribune.

The situation has apparently been brought to a head by the quiet purchase of a majority interest in the Chile Telephone Co., Ltd., by the International Telephone & Telegraph Co. of New York. The purchase, revealed for the first time in a letter to Chile Telephone shareholders, could not be verified at the offices of the International Telephone in New York. All comment, it was said, must come from the Chile Telephone Co.

The purchase was not denied, however, and the "Daily Mail" states further that International Telephone is now offering to buy the remaining outstanding stock at 8 a share.

These developments, following so quickly acquisition of the Montevideo Telephone Co., aroused the cry in the "Daily Mail" of "dreams of creating a United States world telephone monopoly."

The "world monopoly dream" is attributed by the paper to Sosthenes Behn, president of International Telephone, who some time ago merged the Cuban telephone system with the International.

The threat of complete acquisition of the Chile system is not passing unnoticed by British telephone experts and financiers, the paper says. And a counter-move is seen in the appointment of Sir Alexander Roger, chairman of the Automatic Telephone Mfg. Co. board, to the board of the Anglo-Portuguese Telephone Co. This linking the latter with the British manufacturing concern is regarded as the first step in an anti-invasion protection plan.

Telephone Use Features in Fight Against Chain Stores.

Eighteen merchants of the Quality Service Stores of Sayre, Pa., have banded together to fight the competition of the chain stores in their city.

In their advertisements in a daily paper they place particular stress on the value of using the telephone in ordering supplies for the day, realizing the value of this service. "Your telephone is quicker than your feet," is a characteristic slogan.

The merchants see the value of the telephone service both to themselves and their customers and use liberal advertising space in directing attention to their merchandise and quick and convenient methods of obtaining it.

Financing and Depreciation

Texas Telephone Engineer Gives Views Relative to Financing and Depreciation of Telephone Property—Present Situation Compared With Early Days of Industry—Practical Results of Depreciation Theories—Rates of Depreciation

By Herrick Johnson,
Engineer, Two States Telephone Co., Texarkana, Texas

The writer has just finished reading an article treating of various phases connected with telephone financing and, while he is in no way a financier, is able to look at things from various points of view. And the conclusions are that there are a lot of false impressions in the minds of all concerned. These false impressions, if not corrected, will react unfavorably toward both the telephone company and the investment banker. The telephone company needs the banker, and the banker needs the telephone company.

There is a widespread opinion abroad among the investing public that there is only one telephone system, and that is the Bell. When Independents are mentioned, many people do not know what we are talking about. I do not know how conditions are in the United States as a whole, but up to about a year ago there were, according to the best information obtainable, as many Independent telephones in the state of Texas as there were Bell.

I read where securities of doubtful value have been placed on the market, thus calling to mind the early days of the telephone industry, when worthless securities were sold to an unsuspecting public. I fail to see the connection. It may be true that there have been some telephone mergers effected recently, which are not all that might be desired and which savor of wild promotion. However, there are black sheep in any family and this does not mean that every telephone merger should be frowned upon, merely because one or two did not turn out right.

There is, as I view the subject, no similarity in the situation as it was 15 or 20 years ago and as it is today. In the early days of the industry, there were two groups; one well organized—the Bell; the other with no organization—the Independents.

The industry was young, and wherever one company—Bell or Independent—maintained a telephone exchange that seemed to be prospering, then another company would come in and build a duplicate plant and try to take away the business.

In the smaller towns, this resulted in both companies operating at a loss and, in the end, the weaker company went under and generally was forced to sell its holdings at a sacrifice. In the larger cities, generally a combination was worked out which was satisfactory to both parties.

These practices in the early days of the industry may have been wildcat promotion, if we choose to call them that, but nevertheless we must admit that the structure of today is the outcome of the so-called wildcat promotion of 20 years ago.

Harmony of Action and Thought.

If we think negative, depressing thoughts, then we are going to fail in life; but if we think uplifting, cheerful, elevating thoughts, then we are going to be a success in life.

Tell me what a man does, and I will tell you what he thinks. Tell me what he thinks, and I will tell you what he does.

Action, my friends, is nothing more than thought expressed; and action invariably harmonizes with the predominating quality of thought that precedes it. "As a man thinketh in his heart, so is he."—William K. Braasch, in address before The Executives' Club of Chicago.

Also I believe I can safely say that at least nine out of ten of the faliures in the early days of the industry were due to two reasons only, the first that there were two systems in the same town or city and that the public welfare depends on one system in a community. The second cause of failure was lack of adequate capital for proper financing. We, of the telephone fraternity, know that any telephone system in a growing community requires ample resources for expansion.

There is perhaps a third reason entering into the cause of some of the failures of the past. However, this is a secondary reason and is due more to greed and ignorance than to any other cause. That to which I refer is depreciation.

Many companies in the past, and many companies today, operate with no allowance for depreciation. Their doing so in the past was due more to greed and ignorance than any other cause. The industry was new, the plant was new, and although it was commonly known that anything subjected to the action of the elements would wear out eventually, still it was not known when that time would be reached, therefore why worry? The stockholders wanted dividends, and they got them. In the end, they held their own sack.

It has been said by one writer recently that "depreciation is the bug under the chip." Perhaps this is so, but I will venture to say that the party who said this, and also any nine out of ten operators, cannot tell of any sound way to arrive at the proper amount to be charged off for depreciation; and if this is so, then one guess is as good as another.

Some engineers and operators say 4 per cent, some say 5 per cent, some 6 per cent, and some go as high as 7 per cent. I have heard some engineers argue that the amount to be set aside for depreciation should bear a direct relation to the funded indebtedness.

In other words, a company with a large funded debt, the bonds of which had a life of 20 years, should reserve 5 per cent; 25 years, 4 per cent, and so on, the theory being that by making such allowances, the property, at the time the bond issue matures, would be in the same shape as when financed. There is some sense to this argument, providing the bond issues do not extend over too short or too long a period.

The proper amount to reserve to care for depreciation must be determined by each company, and will vary greatly with the locality involved. We all know that anything which is subject to the action of the elements will, in its entirety, wear out; and also that anything composed of movable parts will have some of these parts wear out, some wearing out faster than others.

A telephone switchboard and associated equipment, as well as a telephone instrument, is composed of many parts, most of which are subject to wear. As these parts wear out, they are replaced from time to time, until, although the switchboard may be 15 years old, nothing remains of the original equipment but the cabinet, as all working parts have been replaced at different times. Therefore, although old, the switchboard, except for a coat of varnish, is practically as good as it was when installed 15 years ago. If it were not, it would not properly function and give satisfactory service.

I have in mind a switchboard which has been in constant use in one of the larger offices for about 20 years. It has been enlarged and added to from time to time; however, the original cabinet and framework still remain. This board will continue in service for possibly five years longer when it will be removed from service because of inadequacy, rather than obsolescence, and will have a high salvage value, since it probably will be installed elsewhere.

Now, assuming that the board would be junked rather than salvaged, then, it having a service life of 25 years, the proper rate for depreciation would be 4 per cent. But, it having a high salvage value, the rate of depreciation would perhaps be somewhat less. Twenty years ago, who could foresee that this board would last 25 years?

Then we turn to the outside plant. This is something that is subjected to the action of the elements. The service life of the property will have to be determined from the experience of the individual operator in the particular community served. In a dry, arid climate, unfrequented by violent storms, the outside plant will deteriorate much more slowly than in a section much frequented by severe storms and frequent climatic changes.

The writer recalls to mind some property which he was examining in Texas several years ago. The owner was explaining his intentions with regard to moving some poles because of highway construction. As these were short poles, and 20 years of age, it did not seem practical to me to try to re-use them. However, examination showed them to be sound and fit to re-use without cutting off. In other words, although the poles were 20 years old, they were still sound and fit for many years of service.

The poles referred to were red cedar and the climate was dry. Depreciation in this case was very low, because of the service life, which was high. On the other hand, in a very damp climate I have seen untreated pine poles used which would decay and have to be replaced in less than five years, in which case the depreciation was high, owing to the extremely short service life.

These are two extremes, and are mentioned merely to indicate that the proper amount to be reserved annually must be determined in each individual case and is dependent upon the service life of the units of property under consideration. The proper amount will vary widely with the locality and type of construction involved.

There is a tendency among operators to build stronger and better plants today than ever before, this being especially true of the outside plant where deterioration is greatest. All pole line hardware must be galvanized, thus increasing its service life as well as salvage value. Poles are generally treated and two kinds are generally in use—butt-treated cedar and creosoted pine.

A treated cedar pole has a longer life than an untreated pole, and a cresoted pine pole lasts longer than a treated cedar pole. A creosoted pine pole is heavier and costs more to set; it is produced in the South and, accordingly, the freight is rather high to make the pole popular in the North; however, it is very popular in the South and its use is becoming quite general.

Engineers do not know how long they will last, but estimate their actual life variously at from 30 to 50 years. Their service life is probably shorter than this, depending upon the locality in which they are set. Thus it will be seen that creosoted pine poles have a very low rate of depreciation.

I have used the words "service life" frequently. By this, I refer to the average life of a unit of property in service. For instance, a switchboard may have an indefinitely long life, and if kept in a good state of repair, will last many, many years. However, because of inadequacy, it may be necessary to remove the board long before it is worn out; therefore, the service life of the board is the length of time it is in service.

The same is true of poles, aerial wire and cable. These may be removed from active service long before they are worn out. Therefore, their service life is the length of time these units of property remain in service. Of course, the shorter the period of time the plant is in service, the shorter the service life and the greater the salvage value.

However, the bare cost of each unit of plant is, as a rule, the smallest consideration as regards its cost in service. Therefore, although the service life of the various units of plant is short and the salvage high, the rate for depreciation will be high also. Thus it will be apparent that, in order to get a low rate of depreciation, we must continue the plant in service as long as possible.

Another thought occurs to me along these lines. Given: two properties in practically the same locality, one property a larger one in a large city having several thousand subscribers; the other property a small one of 200 or 300 subscribers in a small town, perhaps having rural subscribers also—which will deteriorate more quickly?

The answer would be that both would deteriorate at the same rate. But would the rate of depreciation be the same in both cases? The answer would be "No." The larger property would, in all probability, have a higher rate. Why? Because the service life of the various units of property going to make up the larger plant would be less than the same units, were they in the smaller community.

The reason for this is apparent if one just stops to think. In the larger city, poles, cables, wire and other units of property are constantly being removed from service because of municipal requirements and inadequacy.

They seldom live their full life. A small size cable but five years old must give way to a larger one. A pole line must be removed and replaced with a heavier and stronger one in order to carry a greater burden. In a few years the line is again found to be inadequate and poles, cable, and wires are removed from service, to give way to underground construction.

Perhaps the street is widened and a new line has to be built, and so on. Then, in the case of underground construction, smaller cables are constantly being removed because of inadequacy. They still would have many years of life were it not for the fact they were too small for the demand and must be replaced with cables of greater capacity. The service life of these units being relatively short, the rate for depreciation must naturally be high.

Now, what happens in the smaller plant? Are poles, cable, wire, switchboard, etc., constantly being removed because of inadequacy and because of municipal requirements? No, they are not; there is more stability, and if the town is a normal, slow-growing community, the chances are that each item of property will remain in service throughout its normal life and will only be removed because of obsolescence and decay. And, as a result, long service life will cause the rate for depreciation to be low.

Therefore, if I have made myself clear, it will be apparent that of two properties in relatively the same locality, the smaller one will have the lower rate of depreciation. Also, if I have made myself clear, it will be apparent that of two properties of equal size, one in a section of the country subject to frequent atmospheric changes, the other in a section not subject to such, then the first mentioned will have the higher rate of depreciation.

There is much more that could be said in regard to depreciation, and much that could be said with regard to the method of arriving at the proper rate, and so forth, but there is not room for such a discussion here and, even though there were room, it would probably not prove interesting. However, this I will say and that is, although it is not a difficult job to arrive at the depreciation rate to be applied to any element of property, it is nevertheless a tedious one and requires considerable research work.

Fire Emphasizes Value of Telephone to Small Town.

The Ainsworth, Neb., Telephone Co. was put out of business for nearly two weeks when lightning struck and demolished the switchboard, and melted up a lot of connections and some wire. The lineman was able to rig up a single wire connection so that communication with the outside world was restored and is being maintained.

The local newspaper said that it was just like turning back the pages of time 45 years. There are 1,700 people resident in the town, and business activities were slowed up, social life given a setback, bridge clubs took vacations and everybody walks to the stores and neighbors when business or another errand calls them.

The editor says that admiration for the jazz age has greatly grown in the face of the experience of doing without one of its most widely used instruments.

Automatic Telephone Fundamentals

This Is One of Series of Articles Explaining in Simple Terms the Mechanical and Electrical Basis of the Strowger Automatic Telephone System, Which Appear Every Week in "Telephony" — Part 22, Lines, Relays and Magnets

By Arthur Bessey Smith, Ph. D.

The selective control of an automatic switch consists of four essential parts—the magnet, the relay, the line, and the calling device. The magnet is designed to be operated by impulses generated by the calling device, and it is the function of the

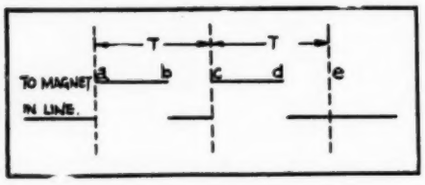

Fig. 107. The Impulse Ratio.

line and the relay to deliver these impulses to the magnet in such a form as to produce the best results.

Since the magnet is the prime object of our desire, we first consider the relay, which must create impulses at such a frequency and with such a character as will fully magnetize the magnet to produce the working stroke and allow sufficient interval for the magnet to de-energize. The line has an important influence on the impulses before they are delivered to the relay. As a usual thing, the impulse generated by the calling device is invariable, or at least it does not exceed rather narrow limits.

Impulses have two properties—frequency and character. By frequency we mean the number of impulses per second. The usual standard is from 9 to 11 impulses per second, although the switches are adjusted to operate on from 5 to 14 impulses per second without failure. This is to allow a sufficient factor of safety to assure an ample margin for the operation of the switch. The character of the impulse means the ratio between one part of the impulse and the total period occupied by the impulse.

When we speak of the current delivered to the magnet of a switch, the impulse consists of a pulsation followed by a period of rest. In Fig. 107, we will suppose that the horizontal straight lines represent the flow of current and assume that we measure the time from left to right.

The current will, therefore, flow through the magnet from *a* to *b* and be cut off from *b* to *c*, flowing again from *c* to *d* with another pause from *d* to *e*. This completes two impulses. Each impulse occupies the length of time *t*. Each impulse is measured from the beginning of one pulsation to the beginning of the next pulsation, as for instance, from *a* to *c*.

The ratio or character of the impulse delivered to the magnet is secured by dividing the length of time *a-b* by the length of time *a-c;* that is, *a-b* divided by *t*. In many cases this is 50 per cent or 0.5, although in the ratio is near 60 per cent or 0.6. The ratio of impulse actually delivered to the magnet varies between these values, though it may sometimes rise somewhat higher.

In the two-wire automatic system the impulses in the line wire and, therefore, in the coil of the line relay, consist of breaks in the current followed by periods of current flow. Referring again to Fig. 107, we will suppose that the horizontal line beginning at the left represents the current flow in the telephone line. At the beginning of the first impulse at *a*, the current is broken and remains broken until the point of time *b*. The current flows from *b* to *c* and is broken again from *c* to *d*, resuming its flow from *d* to *e*, and longer if no further impulses are given.

The total length of the impulse is the same as it was in the case of the magnet; that is, from *a* to *c*. This ideal is not realized, for there is always a time-lag at the beginning and at the end of the break, causing the pulsation in the magnet to vary as described.

The ratio or character of the impulse is the quantity obtained by dividing the length of time *a-b* by the time *a-c;* that is, *a-b* divided by *T*. A very common ratio is 61.5 per cent or 0.615 at the impulse springs of the dial.

The vertical or rotary magnet in the automatic switch is in reality a reciprocating direct-current motor. The work which it has to do is to lift or to rotate the shaft, which it does by magnetic force. The magnetic force not only actuates the shaft, but also stores up energy in the spring by means of which the vibrating part of the motor (armature lever) is restored to normal in the interval between two pulsations.

The speed or frequency of this motor is controlled by a contact. All vertical magnets and the rotary magnets of connector switches are controlled indirectly by the contact of the calling device. The rotary magnets of selector switches have their own vibrating contacts. They are entirely automatic and not dependent upon the subscriber's calling device.

The electromagnet forms the basis for the magnet of a switch as well as for the relay. In Fig. 108, the magnetic circuit of a magnet is shown at the left. It consists of two cores each carrying a winding; the cores are connected at their rear ends by a yoke. In front of the poles of the cores is an armature with a little air gap between the armature and each pole.

The relay is, in general, similar to the magnet, except that usually it has but one core and one return limb or heel piece, at the outer end of which the armature is pivoted. The customary air gap exists between the armature and the pole of the magnet. In both cases the restoring force, which keeps the armature away from the poles, is a spring.

A very largely used relay, Fig. 109, has a much longer and more slender magnetic path. The core and heel piece parallel each other not very far apart, so that in some cases the magnetic leakage is very great. Quick relays have the entire space filled with winding and give very satisfactory performance as to speed and accuracy of impulse. An "accurate relay" is one which repeats to the contacts the same impulse ratio which it receives. Slow relays have a copper collar in part of the winding space, giving the performance which has been described.

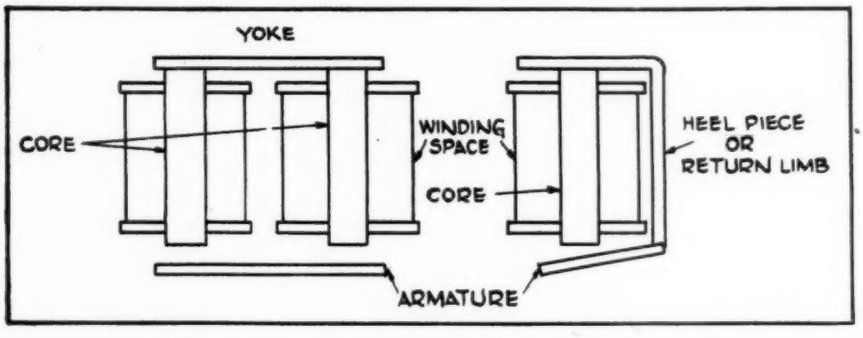

Fig. 108. Form of Electromagnet Used in Automatic Switches.

When an electromagnet is excited, suf-

ficient magnetism must be created in the space between the armature and the poles to cause the armature to move forward. The current flowing around the cores of the magnet creates a magnetomotive force which drives magnetism through the magnetic circuit, all of which is made of soft iron or air.

Unfortunately, not all of the magnetism created by the current passes through the air gaps into the armature; a large part of it is lost by its direct passage from one core to the other through the air. This is called "leakage flux." That magnetism which passes through the air gaps into the armature is the only magnetism which results in a pull on the armature and is, therefore, termed "effective flux."

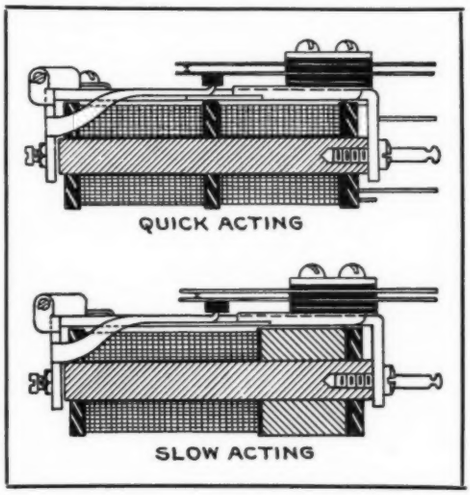

Fig. 109. Form of Relay Largely Used in Automatic Switching Apparatus.

The amount of magnetism and, therefore, the strength of the pull, depends upon the length of this air gap. When the armature is in its normal position the air gap is relatively large, consequently the pull is somewhat weaker than when the armature is close to the pole pieces. If, however, the armature be allowed to come into actual contact with the poles of the magnet, the magnetic pull becomes so strong that it persists, even after the current is cut off from the coils.

This residual magnetism may be so strong as to delay, or even prevent, the armature from releasing. To cure this trouble, it is customary to leave what is termed a "residual air gap." This is secured either by covering the end of each pole with a brass cap, or mounting a brass screw in the armature itself, so arranged that its point strikes the pole.

Every relay or magnet has a certain time-lag when it is energized. This means that an appreciable time elapses from the closure of the electrical circuit to the completion of the stroke of the armature. This may be divided into two parts: First, the time required to build up the electrical current in the coil; second, the time required to start and move the armature from its back to its front stop.

The current is delayed in arriving at full value by a number of causes but we have not the time to discuss all of them here.

The inductance of the coil is a very great factor, as is also the eddy current, produced in the core and in short-circuited turns which are in the winding. The armature may be delayed by its mass. Relays and magnets which are designed to operate at high speed are always made with the moving parts as light as possible, so as to avoid the inertia.

Friction is a factor which does not figure very much if the relays are properly constructed and adjusted.

The stiffness of the restoring spring has considerable to do with delay in the movement of the armature. If the spring is very weak, not much magnetism is required to pull up the armature. If, on the other hand, the spring be rather stiff, the magnetic pull must be much stronger before the armature will move. This delays the response of the armature until the current has arrived very nearly at its full strength, which means, of course, a later time.

Every relay and magnet also has a certain time-lag in releasing. This means that the relay does not fall back immediately upon the cutting-off of the current through its coil. It may be divided into two parts: First, the time required to weaken the magnetism, and second, the time required to move the armature from its front to its back stop.

The chief causes within the relay which delay the vanishing of the magnetism are eddy currents in the core and eddy currents in short-circuited turns of the winding. These eddy currents, whether in core or short-circuited turns, always flow in such direction as to tend to prolong the magnetism of the core. By delaying the weakening of the magnetism, they delay the falling back of the armature.

Inertia and spring tension are the two factors in delaying the motion of the armature after the magnetic pull is weakened enough to let it go. A weak spring will cause a slow motion while a strong spring will cause the armature to snap back very quickly. There are causes outside of the relay which affect this performance, but these will receive treatment a little later.

The essentials of the controlling circuit of an automatic switch extending from the telephone to the switch are shown in Fig. 110. When the circuit is in the condition to operate the switch, we find the calling device springs closed, the line relay *LR* energized, the release relay energized, and a circuit prepared for the vertical magnet and series relay from negative battery to the back contact of the line relay.

There are two relays, which, during any series of impulses, must be kept energized. They are the release relay and the series relay. The former maintains the circuit of the vertical magnet and performs certain other functions vital to the switch. The series relay holds under its control the shifting of the circuits by means of which the next step will be initiated.

It will be seen that as soon as the calling device springs are separated, the line relay will fall back and give an impulse to the series relay and the vertical magnet, both of which will energize. The calling device must close soon enough to give another pulsation to the release relay, so that it may not fall back.

The vertical magnet will implicitly follow all of the impulses delivered by the line relay at its back contact. The series relay, being slow-acting like the release relay, will remain energized throughout the series of impulses.

We can now see our simple problem, namely, that while delivering impulses to the vertical magnet, we must also deliver enough pulsations to the release relay and to the series relay to keep both of them continuously energized.

Since one of them receives its pulsations from the front contact and the other from the back contact of the line relay, it would seem that we should deliver approximately equal pulsations to each. As a matter of fact, this is what is desired and is found to operate perfectly, although the series relay and vertical magnet need a little more energy than the release relay and get from 50 per cent to 60 per cent impulse.

If we allow the line relay to deliver too long an impulse to the series relay and vertical magnet, the release relay is likely to become demagnetized. It may not do it in a few impulses, but might fall back near the end of ten impulses.

On the other hand, if the line relay delivers too light an impulse to the vertical

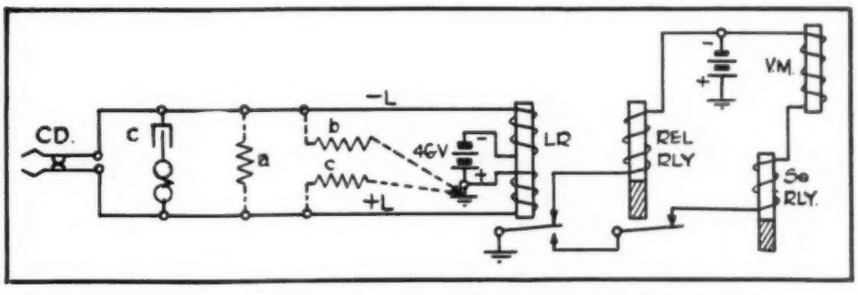

Fig. 110. Controlling Circuit for an Automatic Switch.

magnet and series relay, the release relay will receive abundance of current but the series relay may have a tendency to fall back. The limits, however, are quite wide and there is no difficulty in securing an average adjustment which will give an ample factor of safety under all commercial conditions.

The resistance of the line wire causes the line relay to be slow in energizing and quick in de-energizing. This means the delivery of a rather heavy impulse to the vertical magnet.

If we start with the calling device springs closed, as in Fig. 110, the weak current flow in the line relay causes but little magnetism in the core. This is sufficient to retain the armature, but when the calling device breaks the circuit, the eddy currents produced are not very heavy; consequently, there is a rapid vanishing of the magnetism and a quick falling away of the armature.

When the calling device closes the circuit again, the relatively weak current magnetizes the core very slowly; consequently, the armature is slow in pulling up. Both of these causes assist each other in delivering a longer impulse to the vertical magnet and a shorter impulse to the release relay.

The effect of a mutual leak, *a*, Fig. 110, from minus line to plus line results in a light impulse being delivered to the vertical magnet. This is because there is always flowing in the line relay a small amount of current, even when the calling device springs are open. It will thus be seen that when the calling device opens, the magnetism in the line relay core will not fall as rapidly as usual and, therefore, the armature will not as quickly start to fall back.

When the calling device closes the circuit, it does not need to magnetize the relay from zero, because there is already a current flow through the leak and, therefore, the line relay is partly magnetized. This results in a very rapid magnetization and the consequent rapid action of the armature. Each of these causes assist the other in giving a short pulsation to the vertical magnet and a long pulsation to the release relay.

A leak, such as *b* from $-L$ to earth has the same effect as a mutual leak, except that it operates upon the negative winding only and not upon the entire coil.

The effect of the leak from + L to earth (see Fig. 110) has a slight tendency to delay the falling back of the line relay armature but not by any means as great as the leak from $-L$.

The leak from $+L$ to earth acts as a shunt to the plus winding of the line relay. It does not appreciably delay or assist in the magnetizing of the relay. Its only effect is to allow an eddy current to flow from the plus winding of the relay. This is similar to the action of short-circuited turns in a coil. Its effect is, however, relatively weak. If we have a condenser and bell bridged across the line from $-L$ to $+L$, it causes the line relay to deliver a light impulse to the vertical magnet. When the calling device springs are closed, the condenser is short-circuited and, therefore, discharged. If, now, the calling device opens, all the magnetic energy in the line relay will attempt to discharge itself through the condenser and bell, which permits the current to persist for a time in the line relay, until the energy in the line relay has been discharged.

The eddy current thus produced in the line relay coil is in such a direction as to prolong the magnetism in the coil and thereby to delay the falling away of the armature. In this respect it has the same effect as a mutual leak or a leak from $-L$ to earth.

If a 2 mf. condenser is used with an ordinary 1,400-ohm bell, the limit is soon reached as to the number of bells which may be bridged across the line. But if the condensers are bridged across the line without bells or resistance of any kind, the effect of considerable capacitance is hardly noticeable. The energy of the relay discharges into the condenser almost instantly and does not delay the release.

For the reasons which we have discussed, it has been found necessary to fix the impulse generated by the calling device so that its frequency and character shall not change appreciably with time. The character of impulse is remarkably constant, being fixed by the width of the cam wing and not subject to adjustment.

The frequency depends to a large extent upon the calling device governor, which retains its speed with great constancy. The automatic switch has shown itself also capable of being adjusted to a wide range as to frequency as well as character of impulse. To this wide margin or factor of safety a large part of the success of automatic switches is due.

(To be continued.)

Florida Leads All Southern States in Telephone Gain.

In the group of 12 southern states extending from Virginia to Florida inclusive, and as far west as Louisiana and Arkansas, Kentucky leads in the total number of telephones in actual use, while Florida has the greatest telephone development of 11.6 telephones per each 100 of its population.

There are in this group of states over 1,735,000 telephones serving a population of 25,200,000. This means that these Southern states have practically 10 per cent of the total number of telephones in the country.

Next to Kentucky, Tennessee ranks in total number of telephones, followed in order by Virginia, Georgia, Florida, North Carolina, West Virginia, Louisiana, Arkansas, Alabama, Mississippi and South Carolina. In proportion to population, however, Florida, with a percentage of 11.6, has a big lead over its neighboring state.

Again, Tennessee comes in second place with nine telephones per each hundred of its population, followed by Kentucky with 8.9, West Virginia with 8.5, and Virginia with 7.5.

The comparatively low percentage of some of the states is probably due to the large colored population in such states. Georgia leads this entire group of states in population, land area and postal receipts, Tennessee in individual incomes (1923), North Carolina in number of automobiles and, as already stated, Kentucky in the number of telephones.

Florida has had the largest growth in telephones, population and telephones per hundred population during the last 15 years. From 1912 to 1927, while the population increased 81 per cent, the number of telephones increased 387 per cent.

In the same period, Louisiana showed a growth of 180 per cent in telephones, North Carolina of 132 per cent, Tennessee of 107 per cent, and Alabama of 105 per cent.

One Southern state which showed almost no change in the population in that period was Mississippi, which lost .6 of 1 per cent in number of inhabitants, but which in the 15-year period gained 67 per cent in the number of telephones.

National Broadcasting Company to Open Chicago Program Studios.

The National Broadcasting Co. will open studios in Chicago early in the fall which will supply radio programs to stations of the concern's Red, Blue and Pacific Coast networks. Chicago has been definitely identified with the National Broadcasting Co. since last November, through six stations which have been transmititng network radio programs emanating from New York. These are KYW, WGN, WEBH, WJJD, WMAQ and WQJ.

"The opening of headquarters in Chicago makes possible a more complete broadcasting service in the Middle West," Merlin Hall Aylesworth, president of the company, announces. "We are now able to include in our network Des Moines, Omaha, Bristow, Okla., and Dallas, Tex. These cities will be added by direct wires in the fall when the Chicago studios are complete."

The executive offices and studios in Chicago will be as complete as the company's facilities in New York, according to officials of the National Broadcasting Co. This is necessitated by the fact that the company's operations will be as intensive in the Middle Western city as in the East.

Westphalia, Mo., Property Taken Over by Company at Linn.

The Missouri Mutual Telephone Co., Linn, Mo., has taken over the telephone exchange at Westphalia, Mo. Both exchanges will be operated under one management. T. L. Leonard, 1913 Pine Street, St. Louis, Mo., is president of the company.

THE GERMANS

THE difficulties under which Germany has laboured to maintain her status as a European nation have called forth in a high degree the virtues of industry, courage, application, inventiveness, and enterprise, combining to render her one of the most highly developed of Continental countries.

German domestic characteristics are orderliness, thrift, frugality, and cohesion. The standard of family life in Germany is high, healthy homes being characterized by order and cleanliness, coupled with great care for the welfare of the children.

German inventiveness and system worship led them to an early appreciation of the virtues of "Strowger" with which the capital and many of the larger towns were equipped long since. Now recognized as the premier telephone system throughout the Realm, "Strowger" avoids the risk otherwise prevalent when embarking upon new and untried systems.

Upwards of 3,500,000 Strowger Automatic Telephones installed or under construction throughout the world

"ATM" Strowger

AUTOMATIC TELEPHONE MANUFACTURING COMPANY, LTD.
STROWGER WORKS, MILTON ROAD, EDGE LANE, LIVERPOOL
Associated Company
INTERNATIONAL AUTOMATIC TELEPHONE CO., LTD., LONDON

—and now, São Pa
finds Strowger Au
growth an

THE "onward march" of Strowger Automatic operation knows no boundary lines. All barriers —nationality, tradition, language, climate or custom —fall away before the universal demand for speed and accuracy in communication.

And now, Sao Paulo, the second largest city in Brazil, presents practical testimony to the value of modern telephone equipment in maintaining its recognized commercial distinction.

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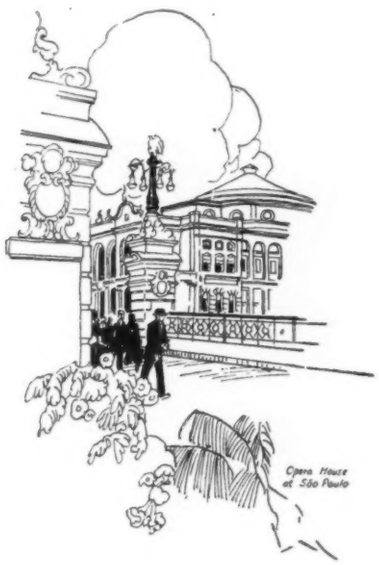
...o, Brazil,
...Amatic essential to ...nprosperity!

A gratifying recognition of the outstanding efficiency and economy of the Strowger Automatic system is contained in orders recently placed by the Brazilian Telephone Company with Automatic Electric Inc. for 12,500 lines of Strowger equipment to be installed in two offices of the Sao Paulo network as a preliminary to the ultimate conversion of the entire city.



Sao Paulo is the commercial center of the thriving agricultural state bearing the same name. Although one of the oldest cities on the South American continent, it is thoroughly modern in its commercial and social aspects, with wide streets and fine buildings and shops. The city has a population of almost a million.

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Outline Of Traffic Calculations
for
Strowger Automatic Systems

by HARVEY S. KINNEY
Traffic Engineer, Automatic Electric Inc.

The path of a call through a Strowger Automatic telephone system is composed of a series of trunks connecting from switch to switch like links in a chain. These trunk links comprise the trunk routes of the exchange. The number and the size of the trunk routes depend upon the traffic originated and its various destinations. Each route should include sufficient trunk paths to care for that portion of the total traffic which passes over it. The successful design of an automatic exchange, therefore, entails not only the provision of adequate quantities of trunking apparatus, but also the efficient arrangement of this apparatus.

The calculation of the various quantities of trunking equipment required, chiefly depends upon the following factors:

(a) Number and distribution of calls originated during the busy hour.
(b) Average duration of a call, usually expressed in seconds.
(c) Grade of service to be rendered.

The number of calls originated during the busy hour includes not only completed conversations, but also "busy", "no answer", and "abandoned" calls as well. The average duration of a call, likewise, is a figure averaged from all these classes of calls.

The basis of all traffic data is the "busy hour." In making traffic calculations, the busiest hour of an average busy day of the year should be chosen. It would be neither practical nor economical to use as a basis the busiest hour of an entire year, which would represent abnormal traffic conditions.

The product of factors (a) and (b) gives the total seconds of trunk occupancy, or, as it is usually termed the "call-seconds." The "call-second" is a very small unit of traffic; a more convenient one being the "100-second equivalent call" which represents 100 seconds of trunk occupancy whether due to one or a number of calls. This unit is sometimes called the "unit call", abbreviated "UC".

When contemplating a change from manual to automatic operation, it is often necessary to use the traffic figures of the manual system as a basis for calculating the quantities of equipment required for the automatic system. These figures may generally be used without apprehension, for, although the calls usually increase in number after the automatic exchange is placed in operation, observations have shown that the average holding time of the calls decreases, but the product of factors (a) and (b) remains approximately the same.

The absolute maximum traffic load which can be carried by one trunk or one switch in an hour is 3600 call-seconds or 36 UC. In order to carry this traffic, the trunk must be continuously occupied during the busy hour. This condition will rarely occur in practice because of the relatively short durations of the calls and the intervals between them. This theoretical maximum value of traffic is also known as a "traffic unit" or "time call", abbreviated "TC". One TC is, therefore, the equivalent of one full hour's trunk occupancy during the busy hour, regardless of how many switches or trunks are involved or how many calls compose the traffic load. For example, if ten trunks carry 4 TC; the sum of the holding times of all of the calls on all ten trunks during the busy hour equals 4 x 3600 seconds, or four hours. Also, the average number of calls simultaneously in progress equals four. While ten trunks are involved in the example cited, it is evident that not less than a minimum of four trunks could have carried the traffic of 4 TC, since 1 TC is an absolute maximum load for one trunk. On account of the irregularity with which calls occur, however, it must always be expected that more than a minimum of four trunks will be required to carry 4 TC, and more than the minimum of ten trunks to carry 10 TC, etc.

The number of trunks required to handle a given traffic will be equal to the maximum number of calls simultaneously in progress during the busy hour. This maximum number will be greater than the number of "TC" by an amount representing the deviation between the maximum simultaneous trunk demand and the average. On certain rare occasions the simultaneous demand rises to extraordinary heights. This happens in any kind of system. It is obviously neither practical nor economical to provide for these abnormal demands, but it is feasible to determine by the laws of probability a certain simultaneous demand as a working maximum which takes into consideration a high grade of service to the user as well as economy to the operating company.

For this purpose tables have been prepared which show the number of trunks required to handle all such simultaneous trunk demands as occur at least once in one hundred or once in one thousand times during the busy hour. Other ratios or "grades of service", such as once in five hundred times are occasionally used. These tables are sometimes incorrectly called "loss" tables.

Besides these, other tables are available which show the number of trunks required if the simultaneous demand is allowed to *exceed* the number of trunks provided say once in one hundred or once in one thousand times.

The term "grade of service" has been applied to ratios such as those mentioned in connection with either type of table. For example, a group of trunks with a certain traffic is said to provide a "grade of service" of 1:100, or 1:1000, etc.

Knowing the traffic, expressed in "UC" or "TC", and the desired "grade of service", the tables are used to find the number of trunks or switches required. Since the "busy hour" is the basis of calculation, the quantities provided will be more than sufficient for the traffic of the rest of the day. Therefore, it is apparent that the all-day grade of service will be much better than that of the busy hour.

Each link in the chain, or step in the series of steps which make up the connection, has its own grade of service. Completion of a call is contingent upon its finding an outlet to the succeeding apparatus at each step in the path. The cumulative figure, resulting from taking all the steps in the connection as a whole, is referred to as the "overall" grade of service.

The standard overall grades of service of the various operating companies differ. Therefore, no definite recommendation is made here as to the overall grade of service to be adopted. The individual grades of service of the various steps making up the connection must be fixed at such values that the desired "overall" grade of service will result. In some cases all steps are given the same individual grade of service. In other cases the individual grades of service are adjusted with reference to the price of equipment employed in the various steps as well as the overall grade of service desired. In general, the more steps there are in a completed connection, the better the grade of service must be in the individual steps.

To summarize, the proper procedure in the calculation of equipment is: first, to secure as accurate traffic data as possible, consisting of the number and distribution of busy hour calls for all classes of lines, and the average holding times of the calls; next, the overall grade of service must be decided upon and the individual grades of service assigned to all the links or steps in the connection; then, by means of standard tables, the correct number of switches or number of trunks may be found for each group in the exchange.

A future article will deal with methods of obtaining traffic data from existing manual systems for use in determining automatic trunk requirements.

This is No. 22 of a series of articles prepared by members of the Engineering Staff of Automatic Electric Inc., covering technical features of the Strowger Automatic Telephone System.

Little Things in Public Relations

Do Little Things Receive Attention Their Importance Warrants?—Their Importance in Public Relations—Illustrations Indicating How Contact If Properly Handled Can Be Means of Building Good Sound Public Relations

By Phil Stockhausen,
Vice-President and General Manager's Office, Illinois Bell Telephone Co.

Little things in the aggregate become big things. Big things or big problems, naturally, are given much attention in every business. Do the little things receive the attention their importance warrants?

If the answer to this question is in the affirmative, the public relations of a telephone company are, perhaps, all that can be desired. If, however, the answer is in the negative, then there is probably much to be accomplished toward gaining that ideal public relations situation which all public service companies are striving to attain.

Just for the sake of argument, let us assume that, in the case of our particular company, the answer to this question is in the negative. What can be done to improve this unsatisfactory condition? My suggestion would be to watch the little things—the hundreds of little daily contacts between employes and the public. If all employes are aware of the fine opportunity that these contacts afford toward cementing a good feeling on the part of the public, for their company, then the little things will receive the attention their importance requires.

For example, I would like to mention the following incident which illustrates how a certain employe of our company took advantage of one of the little contacts and made a staunch booster for her company.

A representative of the local Association of Commerce received a telephone request for some information from a Mr. Cotton, who gave the telephone number, Commerce 9356, where he could be reached when the information was available. The information was readily secured, and the association representative placed a call for Commerce 9356.

He was informed by an operator that the telephone called was for outgoing calls only, and that she could not connect him thereto. Rather than just drop the matter and wait for Mr. Cotton, who evidently had not known that the telephone he used was for outgoing calls only, to call again, the association representative decided to call the business office of the telephone company for further information. He did so and was connected with a young woman, whom we shall call Miss Jones, to whom he told his story, and asked if she would kindly give him the name and location in connection with telephone number, Commerce 9356.

Investigation developed that this telephone was an outgoing public line, located in one of the large railroad depots, of which Miss Jones advised the inquirer. He was nonplussed for a moment and decided to let the matter drop, with the thought that Mr. Cotton might call again.

At this point, however, Miss Jones saw an opportunity to do a little more than was expected of her, so she quickly assured him that possibly Mr. Cotton could be located somehow, and promised to call back shortly. She then called the pay-station attendant at the railroad station, told the story, and asked if she would be kind enough to have Mr. Cotton paged.

This was productive of good results, for as he was located and connected with the Association of Commerce representative, who gave him the information desired in time before his train left. Thus, Miss Jones made a good friend of the association representative for her company, for he was profuse in his thanks for the attention she gave to a little thing which resulted in such a satisfactory outcome.

Another incident along this line occurred recently, and it may be of interest to mention it here. A certain prominent citizen, who owned a small flat building about an hour's ride from his own home, received a complaint from one of his tenants on a bitterly cold evening that there was no heat in the building, and that several small children were in danger of suffering as a result. He immediately tried to get in touch with his janitor by telephone, but for reasons out of control of the telephone company, was unsuccessful.

He had explained the circumstances to the chief operator, who had done everything possible to help him. Again a telephone girl sensed a chance to be of real service. This girl, an operator, who had just finished her tour of duty, volunteered to stop off at the janitor's place on her way home and deliver the message. Miss Brown, as we shall call this operator, was able to locate the janitor, delivered the message to him, and he went to the building immediately and arranged for the necessary heat, with the result that a number of people were made comfortable and happy.

This was just a little thing, but through Miss Brown it received as much attention as though it were an important task in the line of duty. The effect it had on our public relations, as far as the people interested were concerned, is self-evident. The prominent citizen referred to, took the time to write a most appreciative letter to one of our executives with respect to Miss Brown's act, which, for unusual service on the part of a public utility company employe, quite surpassed anything he had encountered in his long experience.

These two illustrations indicate how just a little contact may become a means of rendering some unusual service, occasionally. Not every contact is laden with such a possibility; but every contact, if properly handled, can be a means of building up a good, sound relation with the public.

One thing to be especially guarded against in these contacts is any tone of

Time to Study Methods

If you are in business and did not earn at least 10 per cent more this year than last, you did not get your share; and this is the time you should study your methods to determine why your profits were below the average. Some of the larger organizations increase their profits 20 per cent.

It is estimated that the labor turnover in the United States this year (1926) has been 125 per cent of the number employed. In some industries it has been very much larger. This means that to maintain an average employment roll of 1,000, 1,250 additional persons must be engaged.

Suppose that the average weekly wage is $20 and that it required about one week for the new employe to become proficient, so that the first week's wages is an expense; 1,250 new employes during the year represents an actual loss of $25,000. But some turnover is necessary to maintain the efficiency and morale of the force. If this necessary turnover is 25 per cent, we will still have a preventable loss of $10,000.

If the net profit is 10 per cent, the net return from the first $100,000 of sales is wiped out—a waste of $10,000, which might have been prevented by more care in the selection of employes, better working conditions, more reasonable supervision, greater promotional opportunities, more equitable wages.

Think it over and apply this method of calculating to your own business.—From Bulletin on "Business and Employment Conditions" of Peirce School of Business.

voice or manner that might tend to give an impression of indifference. It is rather natural for subscribers, knowing that a public utility company is a monopoly and having no competition, to feel when there is the least sign of indifference, even though it is only imaginary, that we do not care for their business, or that we do not care whether they like us or not.

We want them to like us—in fact, our success depends on it—and it is, therefore, extremely important that anything we do or say should be as free as possible from any act or tone of voice that might tend to convey an impression of indifference.

Many employes have frequent opportunities in their little, everyday contacts with the public to help build up and maintain good public relations; some employes have but few. Every employe, however, has an occasional chance; and if we can employ all of these chances to the best advantage by being courteous, tactful and sincere in our efforts to serve, the public cannot help but have a fine impression of our company.

The operating force in the traffic department of a telephone company has naturally the greatest number of contacts with the public, each contact being a short, quick transaction where the tone of voice means a great deal and which, therefore, has been developed to a high degree from the standpoint of pleasantness and courtesy. Frequently, one of these contacts is turned into an exceptional bit of service by a wide-awake operator.

At the commercial offices, where subscribers call in person or on the telephone, the contacts are numerous and extremely important, and I believe this is recognized and taken good advantage of to a greater extent than ever before.

Collectors, installers, repairmen, and any other employes who have occasion to visit the premises of subscribers, are in a strategic position to further the interests of their company with particular respect to public relations. I like to think of such a representative as carrying a large imaginary sign, something like the sign that we see now and then propelled by a picketer, which contains in big letters, "I Am the Telephone Company."

So far as the particular subscriber, whose premises are being visited, is concerned, that is just about the way the telephone employe is considered. If he conducts his business courteously, gentlemanly and with an obvious desire to please, then the telephone company has made a good impression and a friend. In all likelihood, the housewife in this case would tell her husband in the evening what a nice type of employe the telephone company has representing it, and as a result that household is for the telephone company.

Some employe in the accounting or other department, where there is no direct contact, may say: "This is all very good, but I might just as well be working for the local department store, so far as having any chance to help build good will for our company is concerned."

To this employe I would venture the answer that, although he has no contact with the public in his work, the opportunity for him to help may appear outside of his office hours, at home, or among his friends at social gatherings.

It might be just a remark about the service or about a telephone bill, or about somebody who is waiting for a telephone to be installed—some little thing, so far as the employe is concerned, but a big thing from the standpoint of the other party—which, if properly followed up and taken care of would result in a friend for the company.

MORAL: If we give proper attention to the little things, the big things may be depended on to take care of themselves.

Operator's Heroic Work Begins Aid After Tornado.

When the telephone exchange blew down at Rock Springs, Tex., during the recent tornado, when nearly 100 persons were killed and 150 injured, the operator, Miss Gladys Lowry, displayed a heroism equal to the occasion.

With a lineman she made her way through the devastated district to a point 1½ miles east of town. There, over a telephone nailed to a post in the open country by the lineman, she told the story of the storm to the outside world.

Throughout the severe electrical storm she put in calls for relief to nearby towns. Lightning forced her from the line several times, preventing a detailed report, but she stuck to her task throughout a night of horror until she was able to secure aid from Fort Clark, some 60 miles distant.

"HAND AND FOOT" SERVICE

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa.

Mary, a misshapen little hunchback, tended the switch at Hocum. Some folks said it was the only thing she could do; as though tending the switch were such simple work!

And, indeed, Mary might have made her task a great deal easier if she had not waited on—yes, I mean waited on—her public, as her mother said, "hand and foot." But she had done this for so many years that she knew all our peculiarities, all our likes and dislikes; our whims and our hobbies.

Oh, she knew us at our best and at our worst. But it never made any difference in her treatment of us. She had a little way all of her own in doling out service according to our needs and varying moods. Unusual requests were never any trouble to her.

And then something happened. If we had not been so self-centered, we might have learned that poor little Mary had the flu, and was weathering it through in order to serve us.

One morning there was a strange voice at the board and we were informed by this voice that Mary had been removed to the hospital; that the doctor said she would never be well enough to work again.

"Ain't it awful?" said the village gossip to the stranger at Central. "She must be nigh dead if she can't work again. Lawsy me! All she did was to set in her chair all day."

"Oh, well," said the young land agent, "somebody else will do the job as well, and things will move on in the same old way."

But they didn't. We got the people we asked for, sometimes after unreasonably long waits, as the new operator had to stop and look up all of our numbers. Mary knew them.

It was provoking, though, that it took her so long to learn simple things, such as that Aunt Het lived on the Burke's farm.

"Oh dear, oh dear," sighed our society matron, as she hung up her receiver—never once trying to help the new operator by looking for the number.

Of course, it was different. However, the new operator worried along until she learned all the numbers. She also learned such things as making the land agent's long distant calls "collect" whether he told her to or not; that the butcher wanted 848 at Crystal City, when he took down his receiver, shouted "848" and hung up; that the grain elevator man never stayed near his telephone after placing a long distance call, but expected her to locate him when she was ready with his call.

After all we went through, she up and married. Since Mary left us the same thing has happened again and again.

"Ain't it awful?" said the village gossip. "Why can't we get the same service Mary gave, and her crippled, too, when they have nothin' to do but set there?"

"Something's wrong, somewhere," said the wise young land agent.

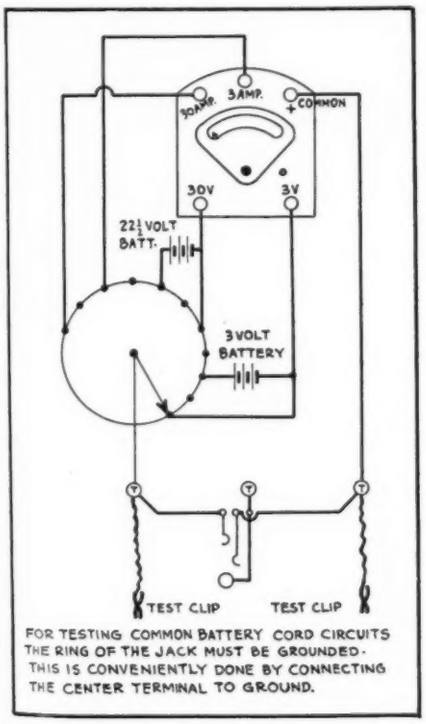
Here and There in Telephone Work

Circuit of a Portable Home-Made Test Set.

Enclosed is a circuit of a portable test set which I made and have used for some time. I find it to be the best all-around set that I have ever used. It is especially convenient on exchanges where there is no test-board man. The cost of construction is very moderate; not much more expensive than a test magneto telephone.

An accurate estimate of the nature of trouble and a close location of a case of line trouble can be had. It is easy and rapid to handle and is easily understood. It is not only good for locating line trouble, but is good for locating bad joints, testing coils, transmitters, receivers, cord circuits and general switchboard and telephone testing, and can be taken right to the job.

In constructing the cabinet for this test set, it is well to get a good cabinet and to do a workmanlike job. We happened to have an old radio cabinet. It is 9 inches high, 7½ inches wide and 5½ inches deep. We fitted in a new panel, and to this panel fitted a Weston model 280 volt-


30AMP.
3AMP.
COMMON
30V
3V
22½ VOLT BATT.
3 VOLT BATTERY
TEST CLIP
TEST CLIP
FOR TESTING COMMON BATTERY CORD CIRCUITS THE RING OF THE JACK MUST BE GROUNDED. THIS IS CONVENIENTLY DONE BY CONNECTING THE CENTER TERMINAL TO GROUND.

Wiring Diagram for a Portable Home-made Test Set.

ammeter with a scale reading of 0-3 and 0-30 amperes, and 0-3 and 0-30 volts. The panel was cut out just so the face of the volt-ammeter would come flush with the front.

In the panel was also mounted a jack and a Carter inductance switch. In wiring this switch, use only every other switch point, thereby eliminating a short-circuit of the internal batteries. A handy man can extend a device in the panel to push the voltmeter button.

For the batteries, we use three volts of a radio C battery and the other one is a real small 22½ volt B battery. The panel is located in the big dimensions of the box, and this is the front of the set. There is a hinged lid to the top on which we put data and tables behind a celluloid sheet. Below the lid there is a sub-panel on which is mounted the binding posts. This being about two inches down, makes a good place to keep the test cords. A nice leather carrying handle completes the job.

After the set is all wired and found to be electrically correct, a table must be made up so the ohms resistance can be determined by the position of the voltmeter hand. We used a resistance of a Wheatstone bridge. Where this is not available, the resistance can be had by finding out from the manufacturer the resistance of the voltmeter and by using the following formula, where V equals first deflection, v equals second deflection, r equals resistance of the voltmeter, and X equals the unknown resistance.

Then X equals $Vr/v - r$, or multiply the first deflection by the resistance of the voltmeter and divide this sum by the second deflection. Then subtract the resistance of the voltmeter, and you have the ohms of the circuit.

The first deflection is had by short-circuiting the test clips, and the second deflection is had by connecting to the circuit to be tested.

It is well to make up the figures over the entire scale of the voltmeter and put them in the lid of the box, since this tester will be used quite frequently and ready reference can be had, instead of stopping to figure out the problem every time a test is made.

I like this set so well that I am taking this opportunity to pass its construction along. It might be that some telephone men would like to construct a similar one.

M. D. Young, Owner,
Republican Valley Telephone Co.
Franklin, Neb.

The "New-School" Manager Talks to "Bill" Jones.

By A. W. Hill.

"Bill" Jones had been the "trouble-shooter" at Benton for a number of years. So many in fact that every man, women and child in the neighborhood served by the Benton office called him "Bill." That in itself is enough to fix Bill's status in the community. Like a lot more Bill Joneses in public service, he hadn't fully awakened to the fact that the world moves on; that the man who was satisfied to drive a horse and buggy yesterday, demanded a closed car with the latest fixin' today. That was the reason Bill was in the manager's office.

The manager was of the school that realized its responsibility to the public its company served, and he was imbued with a firm determination to give them the most for their money, so far as lay in the power of human endeavor.

"Bill," he commenced in a quiet tone, "where did you find the trouble on that Dayton trunk yesterday?"

"Why it was shunted in a transposition down along Old Man Downing's woods, you know, out the other side of Eaton," Bill replied.

"Between poles 149 and 150, wasn't it?" the manager queried.

"Yes, that's right," Jones answered. "Don't see how you guessed it though."

"I didn't exactly guess it; rather I had been expecting it. A fallen tree branch had it twisted up, didn't it?"

"Yes, when did you see it?" Jones queried.

"Oh, only about two weeks ago. Do you remember my telling you at least that far back, to take the brush off that toll lead the first time you were down that way?" the manager questioned.

"Seems like I do remember you saying somethin' about it," Bill answered. "I guess it just slipped my mind."

"That slip just cost your company, roughly speaking, about ten dollars—five for your time and automobile expense, and five more for the time that circuit and the phantom made up on it was out of service. Besides that, you were taking up valuable time that should have been given to our subscribers who were out of service and depending on you to clear them up.

I realize that none of us are infallible but these cases are uncalled for and wasteful. You may not realize it, but you were past that particular point six times since I told you about it. A five-minute stop would not only have done away with the need of that drive of yours yesterday in the snow, but would have prevented a service interruption."

"Well, I guess I don't owe the company a whole lot due to slips," Jones broke in, rather testily.

"Wait a minute, Bill," went on the manager, "I want you to get this right. I didn't call you in this morning to benefit the company any more than I did Bill Jones. I am not trying to inflict any hardships on you. In fact, I want to do everything in my power to make your job easier and more pleasant, and at the same time

give our subscribers a better grade of service,to which they are entitled.

If you should hear a bearing knocking in your car, what would you do? Let it knock until it burned out, or would you get it tightened up or put in oil as the need might require?"

"I guess I'd fix it before it went south," Bill admitted.

"Certainly you would, and save yourself both monetary expense and the inconvenience of being without a car just when, in all probability, you would need it the most. That's the point I am trying to put across. We are selling the public a service. We can't let anything slip that tends to make their service as near 100 per cent as possible, and keep them satisfied.

If your grocer takes full value from you for a dozen of eggs, and you find two bad ones among them, you might let it go the first time; but if it happens more than once, you are going to feel that you are not getting what you paid for.

That is the way with our public. They can readily understand that, during sleet and blizzards and lightning storms, we have no control over such and that they must wait a reasonable time for their service to be restored. They also realize that their telephones and the connecting lines and apparatus are subject to certain unavoidable failures to function, but we must not let anything slip that we can do to prevent such failures. Constructive maintenance; that's the thing we have to keep in mind. See the point, Bill?" he questioned, as he paused.

"Oh, I know that," Jones answered, "but you don't always have time to stop and fix some little thing. Then the next darned thing you know, you've got a piece of trouble."

"That's just the point I am trying to impress. You say that you don't always have time. Let's see if you are right. I have just gone back a few months on some of the troubles you have cleared and picked out a few outstanding cases where I believe I can prove you are mistaken. Here's a case last July on a rural line. It was reported 'noisy.' You wrote up your trouble as 'grounded station carbons at the R 3 party.'

Well and good; but how about the pair of carbon blocks you left out? The next thunder storm burned out an induction coil and transmitter at that station, besides scaring the subscriber out of a year's growth and causing him to be almost resolved to take out his telephone before it burned the house down.

What was the net result? A subscriber to be pacified; a loss of service to him for two days; a trip and the time and material to replace the damage. Would it have taken more than a few minutes on that first trip you made, to replace the protector mounting when you broke the spring so that it would not hold the carbon blocks? That would have prevented what followed."

"Sure that's right," Jones agreed. "But I didn't have another protector mounting along. I intended to stop the next time I passed there. The storm beat me to it."

"That is just another point that crops up right there. Carry enough material along with you for a day's work. You will have to admit, Bill, in view of the fact that we always keep a fairly reasonable supply of material on hand in the storeroom that it is uncalled for not to have it along.

Well, here's another one—a town line, this time. A four-party line up on Penn Street; runs ten sections on electric light poles, with twisted pair. Six wet weather reports on that line. On each occasion the line was out of order for from one to three days. Each time you wrote your trouble up as, 'came O. K.'

And yet finally, after a subscriber wrote a letter bedamning the company and its service in general, you went out and located the trouble. Found where the insulation had worn off again at a tree limb and cleared it by cutting in a piece of new wire and getting it away from the offending limb. Wouldn't that really have been the proper course in the first place? It would certainly have given those four subscribers a different feeling toward the company.

Now just one more case and then, in all fairness I am going to let you be the judge as to whether I have proved my point; whether or not we are getting the best results for the time and energy expended. Do you remember, out in Drumore on that magneto board, putting in a piece of copper wire to replace a fuse on the transmitter battery?"

"Sure. I was in a hurry that day and couldn't make it hold a fuse." Jones replied.

"You knew, when it wouldn't hold a fuse, that there was a short somewhere in the transmitter circuit. What was the result of putting that wire in? The transmitter battery went down and the office was put out of service. It necessitated a drive of 30 miles at 12 o'clock at night to restore it—15 miles each way on bad roads. And when you cleared the actual trouble, it only required about 15 minutes.

That's the kind of thing I am trying to show you, Bill, doesn't pay either you or the company. You were not in a particularly amiable frame of mind at having to get up and take that drive at that hour of the night. The company had signally failed, through your neglect, to furnish the continuous service it was trying to render. What do you think about it?"

"There's only one way to think," Jones answered. "I guess you're right. I've been slippin'. It don't seem to mean much until it's brought right out plain that way."

"All right, let this little confidential chat, sink in, Bill. See if it doesn't make it easier for you to handle your job. And keep in mind the fact that the public you and I serve are our meal ticket; that the better we look after their interests, the better we are bound to fare." And as Jones picked up his hat and started out the door, "Don't forget, Bill, to have enough material along to handle the little items you run across."

New Exchange Building of United Company at LaCrosse, Kans.

Believing that the telephone exchange should occupy quarters comparing favorably with the importance of the service furnished the community, the United Telephone Co. has recently completed a new

Two-story Vari-colored Brick Exchange Building at La Crosse, Kans.

exchange building at La Crosse, Kans. The new building is a two-story vari-colored brick structure of the most modern type.

The front room on the lower floor is attractively finished as a lobby, which includes the offices of the manager and cashier. Two neat long distance booths, equipped with tables and chairs, so that patrons can sit comfortably while making their calls, are located in one corner of the lobby. The lobby is furnished with comfortable chairs for the use of visitors.

The operators can been seen working at the new switchboard from a window in the rear of the lobby. A comfortable restroom for the operators is located in the rear of the operating room.

D. Parsons is manager of the new exchange at La Crosse, which is situated in the heart of the business district. The second floor of the building its fitted up as apartments which are rented.

Further improvements were made at La Crosse recently by the installation of an underground cable system which replaced the pole lines which had been in use.

Uniform Voltage ON DUTY

is the test of a telephone battery

FOR 95% of its useful life, this French telephone battery gives a uniform voltage well above the minimum requirements for telephone transmission. No other telephone battery can even approach its service record.

Cells that have a strong initial voltage and then drop below operating strength long before their power is spent, are a poor economy and a source of trouble and expense.

From the first connection until almost the throw-away point, French batteries deliver smooth, level voltage that cuts down subscribers' complaints and reduces maintenance expense.

Staying power is built into these batteries by an exclusive formula. They have marvelous recuperative ability when on duty and they are slow to deteriorate on the shelf.

Because of their staying power and smooth, level voltage, French telephone batteries satisfy the most exacting telephone requirements.

Your supply house can furnish them. Place an order now!

FRENCH BATTERY COMPANY
MADISON, WISCONSIN

Branches: Minneapolis · Kansas City · Atlanta · Dallas · Chicago · New York
Cleveland · Detroit · Pittsburgh · Denver · Boston · Los Angeles

ALSO MAKERS OF RAY-O-VAC RADIO BATTERIES
AND RAY-O-VAC FLASHLIGHTS AND BATTERIES

When writing to French Battery Co., please mention TELEPHONY.

The Service Back of the Telephone

Electricity and Telephone Play Leading Part in Progress of Times—Things They Do—Unseen Forces That Make Services Possible—Establishment of Telephone System Highly Specialized Work Involving Many People, Much Time

By Edwin F. Hill,
Information Manager, Chesapeake & Potomac Telephone Co., Washington, D. C.

Free air and service are accepted by the average American as if he were to the manor born. When "Sister Susie" or "Brother Jim" drive up to the service station, they expect "real service" and "grouch" about it if they don't get it. They may or may not buy gas and oil, but they usually help themselves to air and water—and they always expect service.

Such service is accepted without any thought of what it may cost to compress the air, supply the water, and do the dozens of little things that cost money, but are seemingly expected by the patron as if he were a member of the firm. Not one in a hundred stops to think of the money and effort that have been put forth by the management to supply these commodities for the convenience of the autoist.

While the autoist is an important factor in the transportation system of today, electricity and the telephone play a leading part in the progress of the times. Both are indispensable in the modern home. Let us see what service is rendered by these indispensable servants:

Without electricity the modern housewife would be lost. When she arises in the morning and finds the house in darkness, she instinctively touches a button and the room is flooded with light. Then the preparation of a good breakfast is materially aided by the electric percolator, toaster, or oven, a cord from which is plugged into a socket, with the almost instantaneous result of delicious coffee or tea, crisp toast, or bacon and eggs, or other eatables, "piping hot" as the family assembles.

The electric refrigerator keeps food cool and fresh and produces ice for table use. The carpet sweeper, washing machine, dishwasher, electric iron, and curling iron—so necessary to milady's boudoir—as well as the cooling breezes of the electric fan are other important uses to which electricity has been put in the modern household of today.

As to the telephone: When the housewife wishes to talk with the "butcher, the baker, or the candle-stick maker" in ordering supplies for running the household or in arranging social matters, she dials the number wanted or else removes the receiver from the hook of her telephone, gives the number to the operator, whose familiar "Number, please?" is a by-word everywhere, and the connection is established or a report given in the shortest possible time. This is still another service that is taken too much for granted by the average American man and woman.

Very little thought is given by the average layman to the unseen forces that make each of these services possible, whether it be from a service station, an electric company, or a telephone system—important factors in our everyday mode of living. This is the story back of the operation—the story behind the scenes, so to speak, that the writer is trying to bring out for the reader's attention.

Key to Profitable Management

The profits of a business are not earned by the sales department on sales. Sales are merely opportunities to realize finally on all the planning and work that have gone before.

As a matter of fact, the profits of a business are not earned by any single department, and some of them are not even earned; they are saved. Your purchasing department, for instance, doesn't earn profits but it may save them. So with your credit department and all your other non-productive departments.

You see, profits are the sum total of an accumulation of many small advantages, earned or saved at every point in a business. Keep that before you always, for it is the key to profitable management.—R. R. Updegraff, in "Captains in Conflict."

Gasoline, oil, water, and air, as furnished by the service station, must be manufactured or produced from their crude state to a usable commodity ready for service on demand. Gasoline is a by-product of either natural gas or oil and is pumped from the innermost depths of the earth, distilled, and refined and transported, perhaps, thousands of miles to the service tank from which it is pumped into your car. Oil is produced and transported in much the same way.

Water, which is piped from some distant river, or mountain stream, is ready for service with the turn of the spigot, but a great deal of engineering, supervision, labor, and expense were necessary to make this possible. Air must be generated and ready to fill the flattened tire of your automobile as required, but it costs money to produce it.

With electricity much the same conditions exist. Electricity is not generated out of fresh air, but is a commodity that must be manufactured and transported from the plant to the consumer, just as telephone service is dependent on the central office and the plant of the system which makes it an indispensable part of every community.

An electric light plant may be operated in the city, or it may be located on some isolated mountain stream whose waters have been harnessed to provide the force that develops the energy that is electricity. Wherever the plant is located, transmission lines with towers or sturdy poles must be constructed with which to carry the threads of copper wire over which the electrical energy passes to the sub-station where it is distributed over low voltage lines to the subscriber.

With the operation of the telephone system, a parallel case exists. The central office—the central station, so to speak—develops the force necessary to the operation of the system. The cables and lines over which the messages are transmitted from the central office to the subscriber are often unseen, but are component parts of the community's system of service.

In establishing a telephone system, there is a great deal more work necessary than the average layman thinks. It is not merely a case of buying a few supplies and engaging a few workmen to connect up the apparatus and put it to work, but it is a highly specialized work that calls for study and foresight on the part of a great many people.

First, a survey must be made of the area to be served and a very definite estimate of the locations where telephone service will be required, when it will be required, and the class of service needed. All of these factors take time and forethought on the part of the engineers involved in making the survey.

When these factors have been determined and the figures summarized, other engineers must locate suitable land on which to construct a central office that will serve the community as shown by the survey.

When the location is made and the property secured, the architects must plan a building that will house the central office equipment necessary to serve the area. Then the engineers, who plan the switchboard and other equipment, get to work and lay out a central office plant that will be suitable for the building and which will serve the ultimate demands of telephone

Put a Good Overcoat on Your Product

"Diamond" Galvanizing

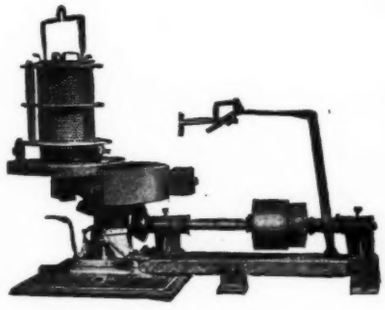
TRADE MARK REG. U. S. PAT. OFF.

The material that you sell to the telephone industry deserves to be protected and beautified by the finest, latest and best galvanizing.—("Diamond.")

Heretofore it has been necessary to recut the threads of the nut, and in some cases the bolt, in order to get a good nut fit, now by the "Diamond" Process the threads on the bolt and nut are both galvanized without recutting and a fine, smooth nut fit obtained.

The vital part of a bolt is in its threads. Why remove the spelter by recutting the nut or the bolt and thus expose the vital part to corrosion?

THE "DIAMOND" PROCESS [PATENTED] IS AVAILABLE TO YOU



1—We should be glad to quote you on your galvanizing requirements.

2—We are in position to license you to galvanize by our process if you operate your own plant.

3—If your own local galvanizer is not so equipped write us.

DIAMOND EXPANSION BOLT CO.

Home Office and Factory, GARWOOD, N. J.

When writing to the Diamond Expansion Bolt Co., please mention TELEPHONY.

service as shown by the survey forecast.

When these plans have been worked out satisfactorily, the specifications for making the equipment for this particular office must be passed along to the manufacturing engineers who design and supervise the construction of the apparatus. Each section and unit must be made to fit each other unit accurately. This must be done in such a way that future equipment can be placed from time to time as needed without rearranging any of the apparatus that was placed under the initial installation, or will be installed under subsequent ones.

After the switchboard and other equipment is installed and ready for service, it must be tested out from every conceivable angle, to be sure that each unit functions with each other unit and that no trouble exists in any part. Every section must be perfect to the "nth degree" for, from the instant that the current is released to the new apparatus, it becomes a thing alive—a pulsating equipment, almost human in its operation, that is so necessary to the business and social life of the community it serves.

The average telephone plant of today in the business districts and large areas of the residential sections is underground. To make this service available, deep trenches had to be dug in the streets in which were placed conduits. At street and alley intersections, and at other intervals, manholes had to be constructed into which huge underground cables containing thousands of wires, each separate and distinct from the other, and all cased in a sheathing of lead to protect them from dampness, have been placed. At the manholes each wire has to be spliced correctly to its mate, in section after section of the cable from the main frame in the central office to the terminals where the underground and aerial cables connect.

In the aerial cable system which extends into the suburbs and outlying districts, pole lines had to be constructed on which the supporting wires and cables are strung and clipped. As the splices are made, the cable outlet terminal boxes on the poles are placed so that the wires may be available where telephone service is required. From the terminal boxes in the building or on the poles, drop wires must be run to the telephone on the premises and the instrument must be installed and maintained.

While telephone service is essential to the business or social life of the city, town, or community of which it is a part, it makes a neighborhood of the country, state, or section by trunk lines that tie them together. But there is much more to the construction, operation, and maintenance of these lines than in merely calling long distance and placing an order for the transmission of one's voice to a distant point. Again a survey must be made by engineers who will locate the most desirable route over which the lines must be built, and order the material necessary to their construction.

The supplies must be secured and placed on the ground, the right-of-way forces must secure the necessary permission to set the poles and see that trees and other obstructions are removed. The construction crews must erect the poles and string the wires which are to become a part of the nation's system of voice highways.

On the completion of this work the circuits are tested out and connected up through the long distance cables to the central office where they are terminated on the switchboard, available for the use of the operators when calls are placed by the telephone using public.

Back of all this is the management of the telephone company who must finance the construction, operation and maintenance of the system. Sufficient funds must be provided with which to expand the system to meet the demands of the public it serves. As the city grows, telephone facilities must be extended so that the service may be supplied as demanded, as each community expands, so must the telephone system expand with it.

With the Manufacturers and Jobbers

Electrical Research Products, Inc., to Handle Vitaphone Sales.

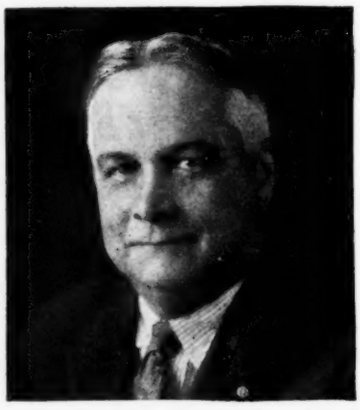
Announcement is made by the Western Electric Co. that its subsidiary, Electrical Research Products, Inc., has taken over from the Vitaphone Corp. the handling of the sale and commercial relations of the equipment used in theaters for the reproduction of the Vitaphone. It will continue to operate from the Vitaphone company's former headquarters in New York City.

In the past, the trade name Vitaphone has been used to apply both to the productions and to the equipment installed in theaters. Under the arrangements recently entered into with Warner Bros., the name Vitaphone will hereafter apply to theatrical productions, while the electrical equipment by which the reproduction is made possible will be known as the Western Electric sound projector system.

The number of theaters equipped with this system has now passed the 100 mark, and installations on existing contracts are scheduled well into the fall.

Leich Electric Co. Obtaining Orders for Switchboards.

While manufacturing interests throughout the country report conditions quiet, and operations on the whole considerably reduced, the Leich Electric Co. of Genoa, Ill., has been favored with an exceptional number of orders for switchboards. During only one week, ending May 21, the following contracts were booked:



A. A. Burch, Managing Director, Automatic Telephones, Ltd., Sidney, Australia, Is Vice-President of Sidney Rotarians.

Common battery equipment for Polo, Ill., consisting of a three-position common battery switchboard and 500 common battery telephones.

Common battery P. B. X. switchboard for the Tri-City Telephone Co., Clinton, Iowa.

Two-position section magneto multiple switchboard addition to present four-position multiple switchboard for the Cebu Telephone & Telegraph Co., Cebu, Phillipine Islands.

Six two-position 200-line common battery P. B. X. switchboards and parts for the U. S. Signal Corps for installation at various army posts.

Although the Leich Electric Co. has for years been building common battery telephones and P. B. X. switchboards, it is of special interest to note that this company is now prepared to supply complete common battery switchboards with any or all features.

Telephone Man Elected Officer of Sydney, Australia, Rotary.

Word has been received from Australia that A. A. Burch, managing director of Automatic Telephones Ltd., Sydney, Australia, has been elected vice-president of the Rotary Club of Sydney for the ensuing year.

Mr. Burch has been very active in the civic affairs of Sydney for many years, and has made for himself a host of friends among the business men of that city. His

ALLMÄNNA TELEFONAKTIEBOLAGET

L.M.ERICSSON

STOCKHOLM
SWEDEN

BRANCHES AT
BUDA-PESTH, HUNGARY
BUENOS-AIRES, ARGENTINE
CALCUTTA, BRITISH INDIA
GENOA, ITALY
HELSINGFORS, FINLAND
LONDON, ENGLAND
MADRID, SPAIN
MELBOURNE, AUSTRALIA
MEXICO, D. F., MEXICO
NAPLES, ITALY
PARIS, FRANCE
PRAGUE, CZECHOSLOVAKIA
REIJEN BIJ BREDA, HOLLAND
RIO DE JANEIRO, BRAZIL
SYDNEY, AUSTRALIA
WARSAW, POLAND
VIENNA, AUSTRIA

MAKERS OF
TELEPHONE INSTRUMENTS AND SWITCHBOARDS.
AUTOMATIC TELEPHONE EXCHANGES, ALL SIZES.
TELEGRAPH AND FIRE ALARM APPARATUS.
TIME RECORDERS.
CABLES AND WIRE FOR ELECTRICAL PURPOSES.
CONTRACTORS FOR BUILDING TELEPHONE EXCHANGES AND OUTSIDE NETS.

COMPLETE CATALOGUES ON APPLICATION

When writing to L. M. Ericsson Telephone Mfg. Co., please mention TELEPHONY.

many friends among telephone men in the United States will be pleased to learn of this new honor which has been conferred upon him.

Are You One of Those Who Pours Coal Into the Sewer?

To illustrate a point—

A coal wagon drove up to the front of an office building. The driver dumped the coal, and, as he was letting it run into the chute, he observed a darky watching him and laughing as only a darky can laugh.

"What's the matter with you?" asked the driver, "Do you always laugh when you see somebody pouring coal into a coal hole?"

"No boss," said the darky, "But, I just can't help laughing when I see somebody pouring coal into a sewer."

The Fort Wayne Printing Co., of Fort Wayne, Ind., is ready to help telephone men from pouring their printing appropriation into the sewer. When the carriage shop was first asked to make an automobile body, the order and the job were unusual. Today they are routine. The first desk to be made with a disappearing typewriter shelf was unusual; so was the first strap to hold a wrist watch and the first metal pencil.

The first of all routine things we see, was one unique, unprecedented. Today they are ordered, made, shipped, invoiced and paid for and the sales recorded on printed forms.

This is where specialization, "the keyword to economical production," plays a prominent part. The Fort Wayne Printing Co. has recognized the potentialities for economy in printing telephone accounting forms and accessories by combining in one large form many orders from different companies and producing at one time, thus reducing the production costs to a considerable extent, and it passes this savings on to its customers.

The idea to manufacture all these essential forms upon so high a standard and sell them at such low prices, necessitated making a specialty of this division of the printing industry. To this end, many special machines and modern equipment had to be installed which today accomplish results previously believed by technical experts to have been impossible.

The result is, that today, with its superior equipment and advanced facilities for handling the printing needs of telephone men, the Fort Wayne company is able to offer the maximum in quality of merchandise and service for every dollar invested.

To Represent Everstick Anchor Co. in Southeastern Territory.

J. C. Asher, chief foreman of construction, Atlanta district, Southern Bell Telephone & Telegraph Co., has recently joined the forces of the Everstick Anchor Co., and will represent it in the Southeastern territory.

Mr. Asher has been with the Southern Bell company for 21 years, and understands the problems of construction work in the field. His knowledge of construction work will greatly assist in promoting the sales of Everstick Anchor Co. products.

Automatic Exchanges Being Installed in Tientsin, China.

The Shanghai representatives of Siemens & Halske of Berlin are installing three exchange systems in Tientsin, China, to serve 6,000 subscribers. These exchanges are to be entirely automatic.

Such a service would be ideal for Shanghai, thinks the Shanghai North-China Daily News, an influential British journal, and would obviate much of the delay experienced from time to time in securing connections due to Chinese operators sometimes having difficulty in understanding calls put through in English and other foreign languages.

Prices in the Metal Markets.

New York, June 6.—Copper—Steady; electrolytic, spot and futures, 12.75c. Tin—Easy; spot and nearby, $68.00; August, $64.75. Iron—Steady and unchanged. Lead—Steady, spot 6.40c. Zinc—Steady; East St. Louis, spot and futures, 6.25c. Antimony—Spot, 12.50c.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

New York Bell Acquires Control of Sullivan Company.

The Interstate Commerce Commission has approved the acquisition by the New York Telephone Co. of control of the Sullivan Telephone Co., Monticello, by the purchase of capital stock, and issued a certificate to that effect.

The Sullivan company owned and operated a system in Sullivan county, New York, consisting of exchanges at Monticello, Callicoon, Lake Huntington, Jeffersonville and White Lake, which collectively served 1,630 subscriber stations. The New York company does not maintain exchanges at the points served by the Sullivan company, but its toll lines connect with the lines of that company.

The territory in which the Sullivan company operated is located in the Catskill Mountain region about 100 miles from New York City, and is a summer resort for a large number of the residents of New York and the metropolitan area. This section has developed rapidly and contains many hotels and boarding houses, some of which are located in the villages and others at points eight to ten miles therefrom.

The character of the development requires the construction and maintenance of a large outside plant, and the demand for telephone service during the summer months is heavy. The Sullivan company was unable to raise the necessary funds to build sufficient outside plant to supply a telephone service to meet the public demand.

All of the capital stock of the Sullivan company, consisting of 800 shares of the par value of $100 each is held by one individual. The New York company proposes to acquire the entire capital stock for $125,000, payable in cash, and will assume a mortgage indebtedness of $85,000 and other liabilities aggregating approximately $30,000.

An appraisal made by engineers of the New York company found the reproduction cost new of the properties less depreciation, to be $213,255.30. None of the properties will be retired from service. In 1926 operating revenues and operating expenses of the Sullivan company were $83,328.96 and $78,182.15, respectively. No change in rate schedules is contemplated.

The New York company plans to spend $156,700 within the next five years for improvements and extensions in the territory served by the Sullivan company. It will operate the plant as a part of the Bell system, and it appears that the proposed acquisition will result in improved service, both local and long distance.

At the hearing, communications from a large number of representative telephone users and petitions signed by various subscribers of the Sullivan company were introduced in evidence, all favoring the proposed acquisition of control.

Ohio Bell State-Wide Investigation Again Faces Difficulties.

The state-wide investigation of telephone rates of the Ohio Bell Telephone Co., which has been threatened several times with discontinuance because of lack of funds, is again approaching a crisis.

This is due to the fact that on June 30 the remainder of the recent special appropriation of $50,000 for the purpose of defraying the survey, lapses into the general

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3. Financing Telephone Operating Properties, or Extensions to Existing Plant.

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fund. Of this appropriation of $50,000, only about $15,000 has been expended. Unless some means are found to make the money available after that date, the investigation is sure to come to an end.

The survey has been going on for about nine months. It is being carried on by the Ohio Utilities Commission and a good deal of time and attention has already been given to the survey by the commission.

The investigation has progressed past the point of taking testimony and both the state and the telephone company have submitted briefs required by the utilities commission. During the next week or ten days both sides are expected to file their replies and exceptions to the briefs, already submitted.

This, however, will not end the work of the attorneys and engineers who have been engaged in the survey, to determine the valuation of the various plants of the company in Ohio. The new Ohio Utilities Commission has let it be known that the investigation may continue for some time until additional facts are ascertained.

One hope held out to the state, which is pushing the investigation, is that the emergency board, which has $650,000 to cover emergencies, may appropriate a sufficient amount to continue the investigation.

The Ohio Utilities Commission still has a lot of work to do, as it will be necessary to fix the rates among all of the Bell exchanges of the state after the values of the telephone plants are ascertained. One of the first duties will be to determine the valuation of each separate plant after the lump value is arrived at.

Asks Authority to Issue Bonds to Retire Notes.

The Blair Telephone Co. has applied to the Nebraska State Railway Commission for authority to issue $60,000 worth of bonds. E. C. Hunt is the principal owner and manager of the company.

He recently completed the larger part of the reconstruction work planned when he purchased control, and finds himself with a considerable amount of notes payable that he prefers to have handled in long-term payments. For this reason, he has arranged to sell the entire issue to the United States Trust Co. of Omaha at 95, and is asking approval by the commission. The proceeds will be used to retire outstanding short-time obligations and to provide money for the additions and betterments that will be necessary.

The board of directors unanimously adopted this method of financing, and local business men approve it as sound business. Since Mr. Hunt started in at Blair he has won for himself and his company a steadily growing popularity. While there were a number who objected to the increase in rates after he had bought out the Bell and consolidated the property with that of the old Independent company, they have about all come around to the point where they are frank to tell him they like the combined service and that it is well worth the small extra price.

Company, Given Increase, Takes Over Battery Maintenance.

The Nebraska State Railway Commission has given authority to the Curtis & Fox Creek Telephone Co. to increase its rates from $1.25 a month net to $1.35. It had asked for $1.50.

The company officers had tired of trying to give service under a rule that required the subscriber to furnish his own batteries, on the theory that this reduced the rate to him. It had, therefore, asked for 25 cents a month additional to take care of the expense of the batteries it proposes supplying itself. The commission applauds this policy as tending to improve the service, but it finds that the battery cost is not to exceed 10 cents a month and limits the increase to that sum.

The company owns no exchange. It purchases switching service for its 120 subscribers from the Curtis Telephone Co. at a cost of 45 cents a month net, this being a substitute for the cost of operation and maintenance of a central office. The officers claimed a total investment of $3,998.65, but the commission refused to accept this, as it was found to be a purely arbitrary figure differing from the original cost set up on the books. No physical valuation has ever been made by the commission.

The commission finds that the books show a deficit of $135 for last year's operation, but it orders a different setup which shows that under the new schedule of rates there will be $401 available for dividends. The company has total revenues of $1,917.48, and pays $724.95 for switching.

Model Rate Application Filed with Nebraska Commission.

What members of the Nebraska State Railway Commission say is the most complete and satisfying application for an increase in rates has just been filed by D. E. McGregor, owner of the Arcadia Telephone Co., which was operated for a number of years by the late J. L. Wait in connection with a lighting plant. After his death his widow sought to carry on, but finally sold the lighting plant to one of the power companies and the telephone property to Mr. McGregor, who owns and operates the Farmers Home Telephone Co.

Mr. McGregor wishes the authority to put in what he calls temporary rates until such time as he has changed to a complete metallic plant. The temporary rates asked for are: Business, $2.50; individual residence, $1.50; party residence, $1.25; farm service, $1.65; switching, 60 cents; desk sets, 25 cents. When the plant has been fully metamorphosed, he will want $3.25 for business and $2.00 for residence, with $1.65 for farm service.

When the company, under its old management, secured an increase in rates some six years ago, the farmers were very indignant. A number ordered their telephones out, others went into a mutual and secured service on a switching basis. Most of the old recalcitrants are back, and a better crop year would have brought about all of them into service getting.

There are 50 business subscribers, 103 taking individual and 18 party-line residence service, 204 on farm lines and 52 being switched. Even at the new rates, Mr. McGregor sets out, his gross revenue will be but $9,822.50 for the next year, which is $624.87 less than operating expenses and necessary setups. These rates, however, are about all that he should ask for under the circumstances. The plant has required and will require still more reconstruction and replacement, and the farm lines must be attended to at once.

Mr. McGregor says that it has been necessary to pay more wages and invest more money in order to make possible the furnishing of proper service. Paragraph by paragraph, in his application, he takes up each request and presents its justification, also attaching a history of the company.

Modified Schedule Allowed Kinloch-Bloomington Company.

The Illinois Commerce Commission, by a recent order, allowed the Kinloch-Bloomington Telephone Co., Bloomington, a modified schedule of rates, by which the company has an average increase of about 15 per cent. The company has ten days from the date of the order in which to file its schedule before the new rates go into effect.

The old and new monthly rates of the company are:

	Old	New
Individual business line....	$4.25	$5.00
Two-party business line....	3.50	4.00
Business extension lines...	1.00	1.00
Individual line, residence...	2.25	2.50
Two-party residence line..	2.00	2.25
Four-party residence line...	1.75	2.00

There was no change asked in the rural rate, which remains at $2 per month. No change was allowed in the residence extension rate, which is $6 per year. Some increases were allowed the company on business extensions and trunks.

The commission also ordered the Kinloch-Bloomington Telephone Co. to set aside annually in equal monthly installments as an operating expense to provide a reserve against depreciation, the sum of $46,119 per annum, plus 5.5 per cent per annum of the cost of all new additions to the plant on and after January 1 of this year.

Also, that all items of expense having to do with the upkeep of the plant shall be treated strictly in accordance with the uniform system of accounts now in effect by the commission, particular attention be-

ing given to the proper apportionment between maintenance and expenses due to depreciation of plant and equipment.

Explaining the order, the commission, in brief, made the following analysis:

"The Kinloch-Bloomington Telephone Co. applied to the Illinois Commerce Commission for a very material increase in telephone rates affecting about 10,000 subscribers in Bloomington and Normal. The commission, after exhaustive inquiry into the facts surrounding the cost of the company's plant, operating expenses, revenues, etc., adjudicated the matter by granting an increase which in the residence rate amounts to 25 cents per month. Considering all classes of service, the increased rates permitted by the commission are less than half of the increases sought by the company.

"In arriving at its decision, the commission refused to include in its findings on operating expenses anything for building up a reserve to take care of bond discount and expense for reimbursing the company for sleet storm damage or for wiping out the cost of certain property that was duplicated when a consolidation was made with the Bell exchange some few years ago.

"The commission also held that the annual allowance for depreciation should be materially less than that for which the company argued. As a result, the rates necessary to meet the commission allowance for expenses, depreciation and a fair return on the value of the property are much less than the rates sought by the company."

Another item of interest in the order is the last clause which says "that the Kinloch-Bloomington Telephone Co., shall install such additional cable and facilities as may be necessary to relieve the present congested condition of the exchange and provide for the future growth of the communities."

Chesapeake & Potomac Company Asks Approval of Purchase.

The Limestone Telephone Co. and the Chesapeake & Potomac Telephone Co. of West Virginia have filed a joint petition with the Interstate Commerce Commission for authority for the purchase by the Chesapeake & Potomac company of the telephone properties of the other company in Virginia and West Virginia for $63,000.

The C. & P. company proposes to transfer the Virginia property to the Chesapeake & Potomac Telephone Co. of Virginia for operation.

Wisconsin Company Authorized to Proceed With Extension.

The Wisconsin Railroad Commission has authorized the Bergen Telephone Co., Clinton, to proceed with the extension to serve the residence of C. A. Larson in Clinton, Rock county.

An objection had been filed to the proposed extension by the Clinton Telephone Co., which made a hearing necessary. The testimony showed that Mr. Larson now resides at a point on county trunk highway P in Clinton.

There is no telephone line on the road in front of his premises, but a line of the Clinton Telephone Co. extends on county trunk P from the east line of section 19 and serves two residences between that corner and Mr. Larson's place. The distance from the east line of section 19 to Mr. Larson's place is about three-fourths of a mile, and the terminus of the Clinton Telephone Co.'s line is about one-fourth of a mile from his premises.

The line of the Bergen Telephone Co. extends on county trunk P from the east to the east line of section 19, turning south at that point on a town road and terminating at the former residence of Mr. Larson about three-fourths of a mile south of the corner. The farm on which Mr. Larson formerly lived was divided between him and a brother and he has constructed a residence at his present location, the former home being occupied by a tenant of his brother.

All of his relatives in this general locality are served by the Bergen Telephone Co. He exchanges work with farmers served by the Bergen company. His church and social connections are almost exclusively in the territory served by the Bergen company.

On the other hand, his nearest railroad station is Clinton. His banking and some other business is transacted at Clinton, and he goes to Clinton for medical and veterinarian service.

The rural rate of the Bergen Telephone Co. is $1.25 per month; that of the Clinton company $1.75 per month. There is a toll charge of five cents per message on communications between the two exchanges.

Reference was made at the hearing to the decision of the commission in 1913 with respect to the proposed extension of the Clinton Telephone Co. to serve Charles Doering (13 W. R. C. R. 166). In that case, the line of the Bergen Telephone Co. was on the road in front of Mr. Doering's house and extended beyond there to serve several customers.

At that time the toll rate between the exchanges was two cents per message, instead of five at present. Moreover, it appeared that Mr. Doering had moved from north of Clinton to the location in question, and that the neighbors with whom he was thrown at the new location were principally served by the Bergen company. The facts in that case appeared to be sufficiently differentiated from those in the present case to warrant a somewhat different treatment.

Mr. Larson is still occupying the same farm upon which his former residence was located, and the change will have no material effect upon his relationships in the community. The situation is quite different from what would have existed should he

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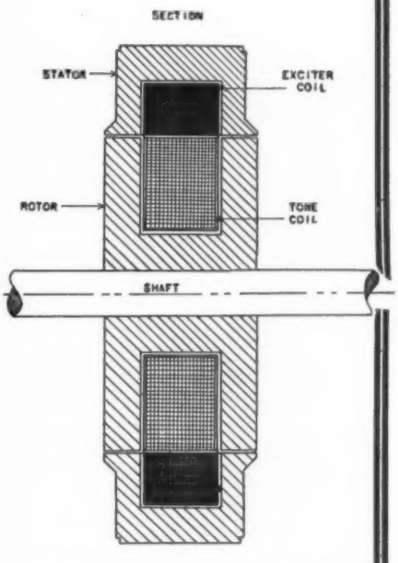

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have moved a considerable distance from his former location so that a new alignment of neighborhood relationships would have been inevitable.

While the proposed extension will involve some duplication of line, it did not appear that any real hardship will be worked upon the Clinton Telephone Co. inasmuch as it was stated by the superintendent of that company that the two customers served on the route where the duplication would be are not likely to wish to change to Bergen service, because of their existing relationships with Clinton.

Having in mind all of the facts as developed at the hearing, the commission was unable to find that public convenience and necessity did not require the extension as proposed, and the Bergen Telephone Co. was, therefore, authorized to proceed with it.

Summary of Commission Rulings and Schedule of Hearings.

INTERSTATE COMMERCE COMMISSION.

May 26: Acquisition by the New York Telephone Co. of control of the Sullivan Telephone Co., Inc., by purchase of capital stock, found to be of advantage to the persons to whom service is to be rendered and in the public interest.

CALIFORNIA.

May 31: Complaint filed by Southwestern Portland Cement Co. against Postal Telegraph-Cable Co., alleging that telephone rates and tolls charged by Postal company between Victorville and Los Angeles and other points in the state are excessive and unreasonable, and asking the commission to conduct an investigation for the purpose of determining the reasonable rates to be charged for such service, and to award complainant reparation on account of alleged excessive charges paid to defendant.

ILLINOIS.

May 4: Order approved cancelling and striking from the files, rate schedule Ill. C. C. 3, original sheet 4 of the Colfax Telephone Co. for service in Colfax, McLean county, and dismissing application of the company without prejudice.

May 4: Order approving contract between the Illinois Bell Telephone Co. and the Chicago Title & Trust Co. for the sale and conveyance of the building and leasehold interest described in order, for $450,000.

May 4: Order approved suspending until September 13, 1927, proposed rates for toll service in Camp Point and toll stations in Adams county, stated in rate schedule Ill. C. C. 1, of the Camp Point Telephone Co.

May 4: Illinois Bell Telephone Co. filed supplements to local exchange rate schedules, effective May 23, 1927. No action taken.

May 4: Order approved directing that for all business transacted and exchanged between the Illinois Southern Telephone Co. and the Goreyville Telephone Co. on and after January 1, 1925, settlement shall be made on the basis as set forth in order.

May 4: Order approved cancelling and annulling rate schedule Ill. C. C., 2, of the Eureka Telephone Co. and authorizing the company to file a modified schedule of rates, designated as Ill. C. C. 3, for Eureka and vicinity, effective June 1, 1927, as set forth in order.

May 4: Order approved dismissing application of the DesPlaines Telephone Co. for increased rates at its Park Ridge and DesPlaines exchanges, stated in rate schedules Ill. C. C. 3.

May 5: Order approved authorizing the Illinois Central Telephone Co. to purchase and E. E. Alford, S. O. Smith and E. E. Vaniman, trustees for the Mutual Telephone Co. to sell as of April 1, 1927, the entire telephone property of that company, located in Virden and Girard and vicinities in Macoupin county, with exceptions as stated in order for $3,620, as set forth therein; also, granting to the Illinois Central Telephone Co. a certificate of convenience and necessity authorizing it to construct, maintain and operate a telephone system and to transact a public utility telephone business in territory now served by the Mutual Telephone Co.

May 5: Order approved directing the Illinois Bell Telephone Co. to appear before the commission at Chicago on May 26, 1927, for the purpose of showing the reasonableness, if it can, of its interpretation of its rules relative to the press news service.

May 5: Rate schedule Ill. C. C. 1 of the Eureka Telephone Co. applying to toll service in Eureka, Woodford county, effective May 21, 1927, passed to file without action.

May 10: Order approved permanently cancelling rate schedule Ill. C. C. 3, for Park Ridge and rate schedule Ill. C. C. 3, for DesPlaines, rendered by the DesPlaines Telephone Co., and dismissing application of the company for increased rates.

May 10: Order approved suspending until September 26, 1927, proposed rates for service in Danville, stated in rate schedule Ill. C. C. 3, of the Vermilion County Telephone Co.

May 10: Order approved suspending until September 30, 1927, proposed rates for service in Fulton, Whiteside county, stated in rate schedule Ill. C. C. 1 of the Tri-City Telephone Co.

May 10: Order approved extending until November 21, 1927, period of suspension of the proposed rates for service in Greenville, Bond county, stated in rate schedule Ill. C. C. 4, of the Bond county Telephone & Telegraph Co.

May 10: No action taken on the following: Illinois Northern Telephone Co.'s rate schedules Ill. C. C. 1, effective May 29, 1927; Canton Home Telephone Co.'s rate schedule Ill. C. C. 1, effective May 30, 1927; DeKalb-Ogle Telephone Co. rate schedule Ill. C. C. 1, effective May 30, 1927; Logan Telephone Co.'s rate schedule Ill. C. C. 1, effective May 15, 1927.

May 11: Order approved dismissing application of the White County Telephone Union for permission to discontinue its exchange located at Mill Shoals, White county.

May 11: Order approved cancelling and annulling supplement No. 1 to Ill. C. C. 1, of the Illinois Southern Telephone Co., Murphysboro, applying to toll service at Belknap, Cypress, Grand Chain, New Burnside and Vienna; and directing the company to continue in effect all free toll service furnished from exchanges at the time the application was filed, etc., as set forth in order.

May 11: Order directing the Illinois Southern Telephone Co., within 30 days, to reconnect and restore service to subscribers of the Vienna exchange area without delay.

May 11: Order approved denying application of the Illinois Southern Telephone Co. for permission to discontinue the operation of the exchange at New Burnside, Johnson county, and dismissing proceedings with leave to reinstate, if the petitioner is able to make arrangements for the continuance of service to subscribers either by transferring subscribers to an adjoining exchange or in some other manner.

May 11: Order denying application of the Illinois Southern Telephone Co. for permission to discontinue operation of exchange at Belknap and Grand Chain, Johnson county, and dismissing proceedings with leave to reinstate, when petitioner has developed some plan whereby subscribers now receiving service from the Belknap and Graind Chain exchanges shall be transferred to or receive service from neighboring exchanges and the manner in which this will be accomplished.

May 18: Order approved dismissing, with leave to reinstate, complaint of the Cicero Chamber of Commerce vs. Illinois Bell Telephone Co. filed July 19, 1921, as to discrimination, etc., in rates and service rendered in Cicero and Chicago, Cook county.

May 18: Order approved suspending until September 20, 1927, proposed rates for toll service in Neoga and vicinity stated in rate schedule Ill. C. C. 1, of the C. T. & N. Telephone Co., Casey.

May 18: Order approved authorizing the Rossville Telephone Co. to sell certain real estate, consisting of the premises formerly occupied as the headquarters and central office of the company in Rossville, Warren county, for $2,500.

May 18: Order approved directing the Illinois Bell Telephone Co. to appear before the commission at its office in Chicago on June 14, 1927, and show cause why it should not comply with the commission's general order at its Springfield and Chicago exchanges wherein it is required to instruct operators to repeat num-

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Chicago Tele. Co.			4-bar	2.00
Monarch	3-bar	2.50		
American Elec. Co.	3-bar	1.50	4-bar	2.00
Stromberg-Carlson	3-bar	2.50	4-bar	3.00
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May 18: Order approved cancelling and annulling revised sheets Nos. 1, 2, 3 and 5, of rate schedule Ill. C. C. 2, of the Kinlock-Bloomington Telephone Co. applying to Bloomington and Normal, McLean county, filed July 28, 1926; and authorizing the Kinloch-Bloomington Telephone Co. to file a modified schedule of rates, designated as Ill. C. C. 3, for its exchanges in Illinois, effective June 1, 1927, as set forth in order.

May 18: Order approved that the rate schedule Ill. C. C. 1, of the Mt. Sterling Telephone Co., applying to toll service in Mt. Sterling and Ill. C. C. 1, of the Home Telephone Co. applying to toll service in Bluffs and Meredosia, withdrawn in accordance with requests from the respective companies.

May 24: Continuation in Chicago of hearing on the proposed new schedule of rates asked by the Watseka Telephone Co.

May 24: Application filed by the People's Telephone Co. of Mercer county, Aledo, for an increase in rates.

June 7: Hearing at Springfield before Commissioner W. J. Smith in the matter of proposed advance in rates for service of the Bond County Telephone & Telegraph Co. in Greenville, Bond county stated in rate schedule Ill. C. C. No. 4.

June 8: Hearing at Springfield before Commissioner Monihan in the matter of proposed advance in rates for service of the Illinois Bell Telephone Co. in Springfield, Sangamon county, stated in rate schedule Ill. C. C. No. 2, of the company.

INDIANA.

May 20: Van Buren Telephone Co., Van Buren, granted an increase in its rate schedule varying from 25 cents to $1 per month, depending on the type of service. It was denied authority to issue $8,000 in bonds.

MISSOURI.

June 1: Rolla Telephone Co., of Rolla, given authority to increase rates approximately 30 per cent on the average. The company has changed from grounded line to common battery metallic service and installed new switchboard equipment.

NORTH DAKOTA.

April 27: Application filed by New Rockford, Sheyenne & Eastern Telephone Co. for authority to move telephone line.

May 12: Schedule of rates approved filed by the Parker Telephone Co., applicable at Pisek.

May 12: Joint application authorized of Charles V. Arvig, Washburn, and J. G. Odegard, to sell and buy, respectively, the property of the Washburn Telephone Co.

May 16: Application granted of the Hannover Mutual Telephone Co. for authority to extend its telephone line.

May 20: Rates approved filed by the Parker Telephone Co., applicable at Forest River.

OHIO.

May 25: Application denied of the Ohio Bell Telephone Co. for authority to charge 50 cents per month for the installation of hand telephone sets.

OKLAHOMA.

June 8: Hearing held on application of Medford Rural Telephone Co., Medford, asking for physical connection with the Southwestern Bell Telephone Co.

PENNSYLVANIA.

June 8: Hearing at Harrisburg on complaints against the increase in rates filed by the Johnstown Telephone Co.

WISCONSIN.

May 17: Joint application approved of the Washington County Telephone Co., Slinger, and the Allenton-Kohlsville Telephone Co., Allenton, for an increase in toll rates between Slinger and Allenton.

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